EPARTMENT OF TECHNO
LO AN LIC

JUNE 8, 1957
VOL. 152 — NO. 23

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

COLOR PROMOTION

As a special May promotion of extension telephones in color, Hawaiian Telephone Co. sold telephones in supermarkets, department stores and home show booths, waiving installation charges. Here Mrs. Sina Walls takes order.—Photo, Skip Calhoun.

Guaranteed Circulation This Issue
11,964, of Which 11,413 Is Paid

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

MADE IN

We find there are some operating companies which don't realize that the Stromberg-Carlson telephone instrument is today—and has been for four years—what everybody calls a "500" phone.

IN AMERICA BY AMERICANS

S-C STROMBERG-CARLSON

FLASHES AND PLUGS

THE HISTORICAL SENSE. A man who lived near Central Park in New York took his son for walks there every Sunday. He noticed that the small boy showed a touching attachment to the equestrian statue of General Sherman.

Finally, when the family was about to move to the suburbs, they went for a farewell visit. The boy flung his arms around the base of the statue and sobbed out, "Good-bye, Sherman."

Touched by such patriotic fervor, the father began telling of the general's career. The child was only mildly interested. He took a final glance at the statue. "Oh," he said. "Is that the man sitting on Sherman?"

•

JIMMY MAKES THE GRADE. Mr. J. O. Parker, general information manager of the Mountain States Telephone & Telegraph Co. sends us the following interesting and factual story:

Andrew McGregor, age 75 and living alone in a remote mountain cabin near Bailey, Colo., did not have a telephone. However, if all goes well as expected and he returns home from the hospital following a recent paralyzing stroke, Mr. McGregor may well want to modernize his communications.

At the time he suffered the stroke, in his isolated cabin, Mr. McGregor had no other company than Jimmy, a mongrel dog. With no help in sight, he scribbled a note of appeal—"I can't walk. Help me!"—and fastened the note to the collar of his dog. He told his messenger to go find somebody. Since the dog had a reputation in the area for being wild and unfriendly, it was a long shot.

Seeming to realize the importance of his mission, Jimmy headed for civilization. Because boys and dogs just seem to go together, he made cautious, friendly overtures to Dick Dinsmore, 14, of Littleton, Colo., who was helping open the fishing season. The message was discovered and help was soon on the way. Mr. McGregor is now in the hospital recuperating and Jimmy, the mongrel who carried the life-saving message, has risen substantially in the esteem of the community.

•

ONLY SIX MONTHS TO GO. An information operator gets the hard questions along with the easy ones, but Jean Thomas, in Flint, Mich., had to do some quick thinking the other day to answer a call from a small boy who wanted the telephone number of the North Pole, reports "The Michigan Bell."

Jean said she was sorry, but "we just don't have a number listed." "Well," said the child, "I have just got to get ahold of Santa Claus. He left his boot here at Christmas and I'm afraid he'll need it before next year."

CHANGE OF ADDRESS

Please notify your local postmaster and Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

June 8, 1957

CONTENTS

IN THE NATION'S CAPITAL 17
By Francis X. Welch

LOCATING OPENS IN DISTRIBUTION AND PARALLEL LINE WIRE 20
By Daniel S. Seitz

DEMAND INCREASING FOR SPECIAL USES OF TELEPHONE FACILITIES 22
By B. W. Ford

USE OF OSCILLOSCOPE IN TELEPHONE—Part 2 ... 28
By Harold B. McKay

THE OPERATOR'S CORNER 32
By Mayme Workman

THE PLANT MAN'S NOTEBOOK 36
By Ray Blain

PLANT MAN'S QUIZ 38
By Ray Blain

COURTS AND COMMISSIONS 39

NEWS ON NEW PRODUCTS 58

H. D. FARGO JR., *President and Director of Advertising* • A. J. STULTS, *Vice President and Advertising Manager* • R. C. RENO, *Vice President and Editor* • DAN S. FARGO, *Vice President and Managing Editor* • FRANCES E. CRETCHER, *Associate Editor* • FRANCIS X. WELCH, *Washington Editor* • RAY BLAIN, *Technical Editorial Director* • HAROLD B. McKAY, *Electronics Editor* • MAYME WORKMAN, *Traffic Editor* • VIVIAN RYDEN, *Circulation Manager.*

WESTERN REPRESENTATIVES: McDonald-Thompson, San Francisco, Cal. Also offices in Los Angeles, Seattle, Houston, Tex.; Tulsa, Okla., and Denver, Colo.

TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago 5, Ill. 25c per copy (except special issues—40c). Subscription $4.00, 1-year; $6.50, 2-years; $8.50, 3-years. Add $1.00 per year for postage to Canada and Pan American countries; $2.00 per year to Foreign countries. Telephone WAbash 2-2435.

XUM

New Catalog No. 451 Protector

Whether the need for a single pair lightning and static drainage unit is scattered or highly localized is best known to the folks who operate the telephone plant.

The term "buffer" has been used to describe such a protective unit and the term seems to be well suited to Reliable's new Catalog Number 451. Its function is to drain lightning and static discharges from open wires that are connected to cable and reduce the voltage at the cable junction.

The new unit protects protected cable terminals and will perform in front of unprotected terminals. It is also protection for loud speakers, coils, filters and such.

Here again Reliable engineers have studied both cause and effect and have designed a protector to take care of a problem that is recognized throughout the Communications Field.

60 YEARS OF INDEPENDENT TELEPHONY

Reliable

RELIABLE ELECTRIC CO. • CHICAGO

DID YOU KNOW THAT...

Kellogg was the first to adopt bakelite mouthpieces, receiver shells and insulating parts, and had the first bakelite molding department in the telephone industry.

XUM

We have exactly
what you want . . .
the KELLOGG K500
telephone in both desk
and wall models

KELLOGG
A DIVISION OF I T & T

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
A Division of
International Telephone and Telegraph Corporation
Sales Offices: 79 W. Monroe St., Chicago 3, Ill.
Phone: DEarborn 2-0750

KELLOGG Branch Warehouses and Offices:

6000 W. 51st Street
Chicago 38, Illinois
REliance 5-5445

410 N. Syndicate Ave.
St. Paul 4, Minnesota
Nestor 5878

504 County Bank and Trust Bldg.
Passaic, New Jersey
Prescott 9-3610

23 Broderick Road
Burlingame, California
OXford 7-5780

4501 Truman Road
Kansas City 1, Missouri
Humboldt 7085

1515 Turtle Creek Blvd.
Dallas 7, Texas
Riverside 7-5191

1555 West Fourth Street
Mansfield, Ohio
Mansfield 7-2816

1594 Southland Circle, N.W.
Atlanta, Georgia
Sycamore 4-2441

Export Distributor:
International Standard Electric Corp.
50 Church Street
New York 7, New York

XUM

How you can save on building costw

with XY® Dial switching equipment

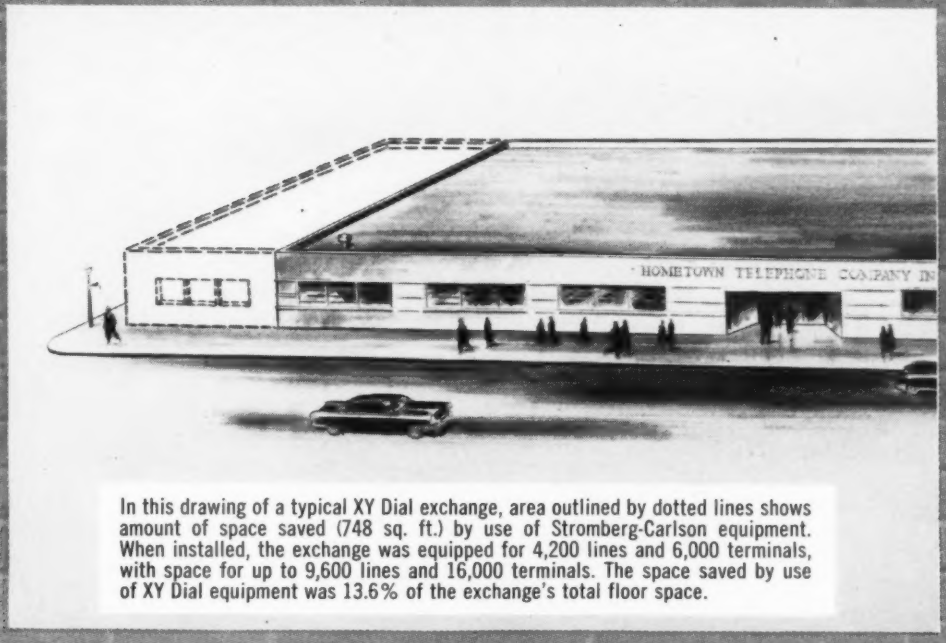
WHEN you invest in new central office facilities, a large part of your outlay goes into the *building itself.*

With construction costs skyrocketing, you'll welcome the substantial savings you get with Stromberg-Carlson equipment because it saves a great deal of space. It saves space *because it is double-sided:* switches and associated circuit plates are mounted on *both sides* of the equipment bay frames.

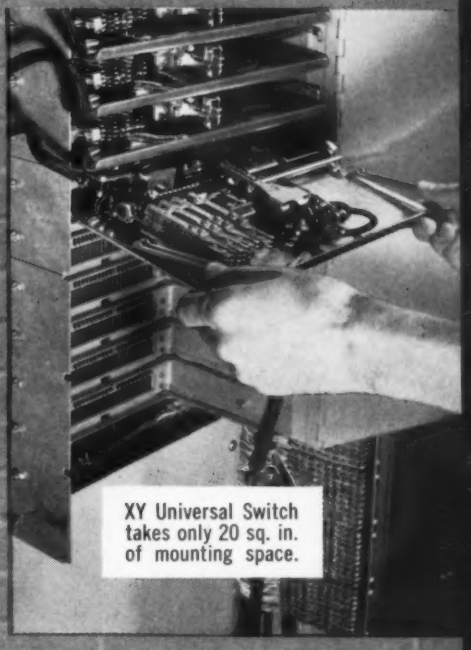
The drawing below shows the actual amount of floor space saved—748 square feet—in a typical XY Dial switching installation.

Other important features of the XY Dial System are: vertical multiple wire banks that need no cleaning or oiling; *welded twin contacts* —22.7 times as reliable as single contacts; the XY Universal Switch that works as a line finder, selector or connector; 100% access to toll; the "Fourth Wire" which performs many extra jobs; wipers that never need changing.

To get the complete XY story, ask your Stromberg-Carlson representative for Booklet T-2003, which describes XY Dial Systems.



In this drawing of a typical XY Dial exchange, area outlined by dotted lines shows amount of space saved (748 sq. ft.) by use of Stromberg-Carlson equipment. When installed, the exchange was equipped for 4,200 lines and 6,000 terminals, with space for up to 9,600 lines and 16,000 terminals. The space saved by use of XY Dial equipment was 13.6% of the exchange's total floor space.



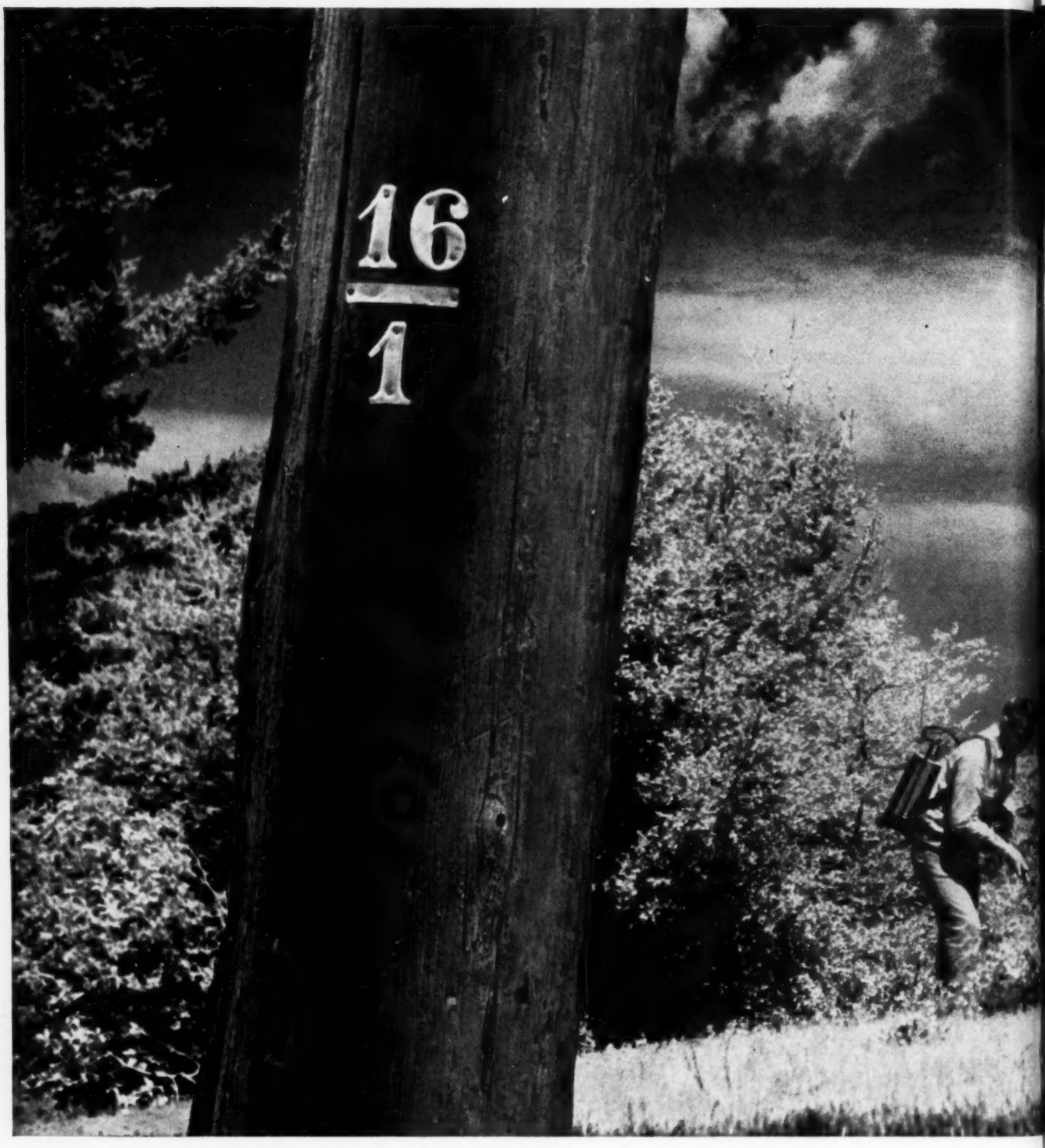
XY Universal Switch takes only 20 sq. in. of mounting space.

S-C STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 9, Chicago 9, Kansas City 9, Rochester 3, San Francisco

GD GENERAL DYNAMICS



Clear across the country at half the cost . . . *with Dow Brush and Weed Killers*

Men with axes and machinery used to sweat out the job of keeping this right-of-way clear. And what they cut one year would be back waiting for the blade the next.

Now this trained crew keeps the way clear at half the cost . . . with Dow brush and weed killers. And their job

gets simpler all the time. After an initial treatment, it's just "touch-up and go" during following seasons because you get progressive control with Dow chemicals.

No matter what vegetation problem they run into along the way, they have a specialized Dow herbicide to whip it. For brush they use Esteron® 245, Kuron® and Esteron Brush Killer. To control both broad-leaf and narrow-leaf weeds in substations and pole-yards, they apply Baron®.

Whether your own crew or a professional spraying contractor does the job, you'll find Dow chemicals can cut your vegetation-control bill in half. Learn more about this cost-saving way to keep your rights-of-way full size and clear for easier maintenance, construction and patrol. Write to: THE DOW CHEMICAL COMPANY, Industrial Section, Agricultural Chemical Sales Dept., Midland, Michigan.

YOU CAN DEPEND ON DOW

Guess who suggested using more paystations!

It all began when Jim Brown did a little survey on the side. He found many busy locations where more outdoor paystations would offer a good source of added revenue. That convinced the boss, so AUTELCO paystations were installed in some of these new spots.

Result: company revenue really jumped! Jim's co-workers have nominated him "King of the Full Coin Box", and it's rumored Jim is in line for promotion.

You, too, can help bring in added revenue. Write for our Survey Simplifier. It shows you how to pick the locations that will pay best. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

A member of the General Telephone System - One of America's great communications systems

GENERAL SYSTEM

An ounce of scientific prevention

Like the dramatic progress in medical science, modern tree care bears little resemblance to the crude methods of only fifty years ago. No longer is it enough to repair damage—to cut away a limb that has died. Today, as always, we seek the answer "Why"—the cause of the damage or disease and apply every modern technique and curative treatment. Only in this way can America's rich heritage of shade trees be preserved.

Scientific tree care is available to you through your local Bartlett representative, a highly skilled technician backed by the knowledge and experience of the Bartlett Tree Research Laboratories. If you have trees which you value, it will pay you to consult him before you need him. No one knows better than a Bartlett client, that an ounce of scientific prevention is worth many many pounds of cure.

REMEMBER

Our long experience in working with both utilities and the public is your assurance of dependable work and good customer relations.

1907-1957 The Bartlett Way 50 years Progress in Scientific Tree Care

BARTLETT TREE EXPERTS

Home Office, Research Laboratories and Experimental Grounds, Bartlett School of Tree Surgery, Stamford, Conn. Local Offices from Maine to the Carolinas, and West to Indiana. See your Local Telephone Directory for Local Address.

NORTH WALL PHONES

designed and built as wall phones

The new North Wall Telephone is a true wall telephone, designed as a wall telephone, built as a wall telephone, sold as a wall telephone.

It is not a desk set hung on a wall, nor is it an adaptation or "version" of a standard phone.

The clean "picture frame" simplicity of the case is unmarred by moulded handset-hangers, brackets, or cut outs.

The gleaming, chromium plated hookswitch is located on the front of the instrument for greatest convenience.

North's Wall Telephone, with the new North universal base, is interchangeable with North's desk telephone (except for the case, hookswitch and dial plate adapter), and the new base will accommodate most single coil high frequency ringers.

North Wall Telephones come in seven Color-Tones, Richland Red, Emperor Blue, Chartreuse Yellow, Tawny Green, Indian Ivory, Coral Sand, and Executive Grey, as well as black. They add color and convenience to kitchens, dens, family rooms, workshops, and garages.

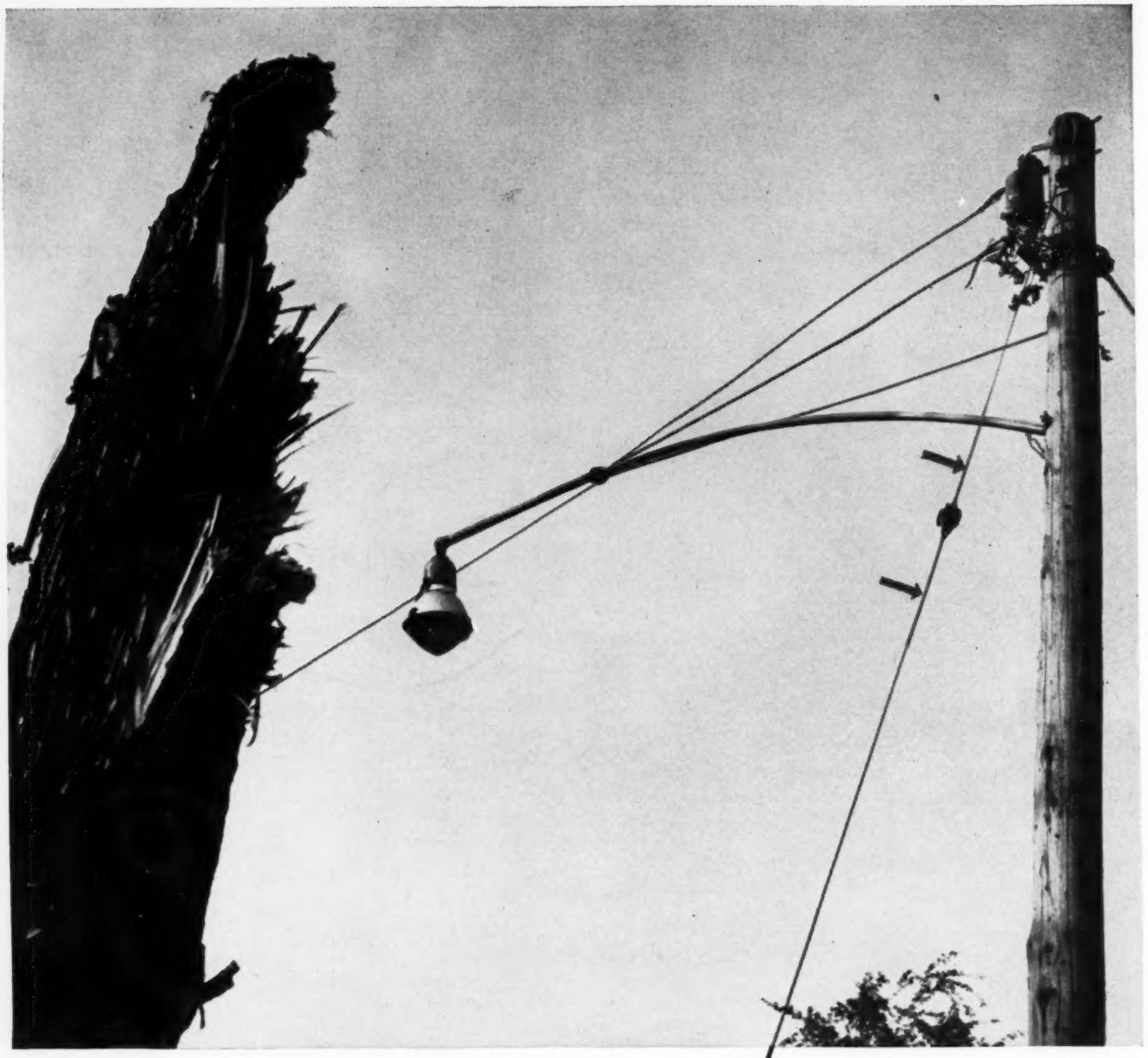
North Wall Telephones in Color-Tones or black are now available from stock for quick delivery.

NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO

XUM

GHI 4
DEF 3
JKL 5
ABC 2
MNO 6
FR 6-1131
PRS 7
TUV 8
WXY 9
OPERATOR 0



75 - 100 MPH Wind Rips off Tree

PLP *GUY-GRIP* Dead-Ends Stand Firm

Nature provided the test. Hurricane-strength winds—75 - 100 miles an hour—snapped off the top half of a huge elm tree ... and hurled it against both pole and guy. After the debris was removed ... the picture told its own dramatic story. Here's graphic evidence that today's best answer to any guying problem ... subjected to any kind of condition ... is PLP Guy-Grip dead-ends.

Dept. No. TR2A

Made in accordance with or for use under U. S. Patent No. 2,761,273; other patents pending.

PX – 77

PLP

PREFORMED LINE PRODUCTS COMPANY

5349 St. Clair Avenue Cleveland 3, Ohio

TELEPHONE: CLEVELAND EXPRESS 1-3571

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Battle shaping up in Congress over President's request that interest rates charged by federal lending agencies be raised. General buys AEC telephone plant in Richland, Wash.

A PRETTY good battle is shaping up in Congress over the request of President Eisenhower that legislation be adopted for boosting the interest rates charged by federal lending agencies. The proposal was made by President Eisenhower in a discussion with Republican leaders in Congress on policy legislation for the Rural Electrification Administration. Up to now the position of Agriculture Secretary Benson and REA Administrator Hamil has been that the President was not referring specifically to REA's interest rate (2 per cent) when he made his general comment, early in the year (in his budget message to Congress), to the effect that federal government agencies ought not to be making loans at rates less than the Treasury pays.

But, there can be no further doubt that President Eisenhower did have REA in mind, and in fact that REA was the main agency which the President considered in need for an interest rate boost. It was the House minority leader, Representative Halleck (R., Ind.), who probably brought up the subject of REA's cheap interest rates when he complained to the White House meeting that an electric cooperative in his state, the Hoosier Cooperative Energy, Inc., had applied for a 42 million dollar loan to build a power plant which would sell partly to REA cooperatives and partly to private industry.

Actually, the Indiana loan was one of the controversial "super co-op" types whereby the REA money would be used to finance the construction of a plant to be leased back to a private industrial customer. The application had aroused the opposition of the Indiana Public Service Commission, which intervened by asking REA to refuse the loan.

A number of Republican senators, including Bridges of New Hampshire and Saltonstall of Massachusetts were quite surprised that REA had ever considered making loans at 2 per cent for financing the construction of power plants to be used mainly to supply a large industrial customer. Saltonstall thought such a use of REA funds was going beyond the purpose and intent of Congress. Anyway, Senator Bridges, who is chairman of the Senate Republican policy committee, said that the administration is drafting a bill to prevent all government agencies from making loans at less than the interest rate paid by the Treasury on its borrowings.

Presumably, such legislation would cover REA rural telephone loans as well as REA electrification loans. Such loans are now made at the statutory rate of 2 per cent. Senator Bridges told reporters that "it is indefensible for government agencies to make 2 per cent loans when the government itself has to pay an average of about 3½ per cent to borrow money." He added that the 2 per cent rate was set by law at a time when the government was getting its money at a much cheaper rate.

There are already two bills introduced in the House of Representatives to raise REA's interest rates. One of these, by Representative Hiestand (R., Cal.), would not only require REA to charge as much interest as the federal government pays for borrowing funds placed at REA's disposal, but it would also require REA to charge borrowers a service charge to take care of administrative expenses in connection with administering and processing particular loans. The other bill, somewhat similar, was introduced by Representative Becker (R., N. Y.). Neither of these bills, however, is likely to be taken over as "the administration's bill" on the subject. Senator Bridges quoted the President as saying that the proposed bill had been approved by the Budget Bureau and was being reviewed by the Treasury Department.

The Indiana Public Service Commission asked Secretary Benson to disapprove the 42 million dollar loan sought by the Hoosier Cooperative Energy, Inc., because it would duplicate service by private electric utility companies in that state. Hoosier's generators would supply some of their power to Richards & Associates, and its subsidiary, the South Wire Co., Carrollton, Ga., for an aluminum plant they plan to build in Indiana. Hoosier also would supply power to its nine member electric distribution cooperatives in southwestern Indiana.

The Agriculture Department's REA suggested that the Indiana commission get together with power companies and the cooperatives to try to "arrive at a conclusion" on the loan, according to the REA officials. Aides said the REA received the loan application about mid-May. It normally takes months, they added, before the REA completes studies and decides whether to approve a loan. Hoosier has not borrowed from the REA before.

The loan application proposes construction of three steam-generating units having 66,000 kilowatts capacity each near Petersburg, Ind., and about 900 miles of transmission line. The three units would have a firm capacity totaling 132,000 kilowatts and stand-by of 66,000 kilowatts. Hoosier would lease the plant to Richards, retaining first rights to buy back power for the cooperatives. The co-ops would not need all 132,000 kilowatts of firm capacity at first. Richards would use the surplus power for its aluminum plant,

which would need about 66,000 kilowatts. The company would build 55 miles of transmission line on its own to carry power to its plant.

Chairman John Van Ness of the Indiana commission said he opposed the loan because "we see no reason why the taxpayer should pay the costs for generation when service already is available from private companies which pay federal and state taxes. We feel the system would be a duplication of service available from private utilities. We have statements from the utilities that they will supply any industrial plant." In addition, he claimed the cooperative's proposal "should have been cleared" with his commission.

Secretary Benson made no commitment to the Indiana commission chairman, but he commented that the REA "does not want to promote duplicate services." The official said the commission "will talk things over" with the utilities and cooperative to see if the problem "can be solved that way, without disagreement or bad feeling." Governor Handley of Indiana backs the state commission in its opposition to the REA loans, according to Chairman Van Ness.

Whatever bill the administration brings up in Congress, it is sure to

New REA Telephone Loans Total $1,590,000

More than 1,100 families now without telephones in rural areas of four states and more than 1,750 existing subscribers will benefit from telephone loans approved by the Rural Electrification Administration the week of May 19. The U. S. Department of Agriculture announced that borrowers in Kansas, Kentucky, Maine and Minnesota will use the loan funds, totaling $1,590,000, to improve and extend rural service in eight counties. Details of the loans follow:

Echo Telephone Co., Sheperdsville, Ky., $469,000, second loan (May 21).

The borrower proposes to use these funds to provide dial service for 880 additional subscribers without telephones.

Funds are also included in this loan to finance the construction of a new commercial office and automatic central office at Sheperdsville, and a new automatic central office at Mt. Washington. Originally the borrower had planned to rent these facilities.

The two loans totaling $1,018,000 will enable the Kentucky company to offer new and improved service to 2,571 subscribers. The system will consist of 247 miles of line and the two exchanges.

Gerald Simms is president and William R. Bacon is manager of the Echo Telephone Co.

•

Eastern Telephone Co., West Enfield, Me.; $257,000, third loan (May 21).

With this loan, the borrower will expand its operating area to provide modern dial service to 331 additional rural subscribers, including service for the first time for 64 farm families.

The company has recently acquired the Knox-Montville Telephone Co. at Freedom, and the Palermo Telephone Co.

New construction will include automatic central offices at Freedom and and in the Township of Palermo.

Provision is made in this loan also for funds to construct a new headquarters building in the Liberty area.

The three REA loans totaling $715,000 will make it possible for this company to provide new and improved service to 1,686 rural subscribers. The system will consist of dial exchanges at Freedom, Liberty, Morrill, Palermo and West Enfield.

Carlon N. Grosse is president and manager of the Eastern Telephone Co.

•

The American Communication Co., Belleville, Kan.; $723,000, fourth loan (May 23).

The borrower proposes to use these funds to furnish new and improved service to 1,323 subscribers, including service for the first time to 153 farm families now without telephones. To serve these additional subscribers, the company plans to extend its service area in Kansas and Nebraska.

The company plans to acquire the following properties with loan funds: Farmers Mutual Telephone Co. of Jewell County, serving around Burr Oak and North Branch, Kan.; the Peoples Telephone Co., serving in and around Lebanon, Kan.; the Riverton Telephone Co., serving in and around Riverton, Neb. In addition the company plans to acquire with its own funds the facilities of the Peoples Telephone Co., serving in and around Bellaire, Kan., and the Thornburg Telephone Co., in and around Thornburg and Wormser, Kan. The acquired properties now furnish magneto service to 1,170 subscribers, including 38 switchers, in the two states.

New facilities required to serve the enlarged service area will include automatic central offices at Burr Oak, Kan., and Riverton, Neb., and new automatic equipment to replace the magneto facilities in the existing Lebanon building.

A portion of the loan will be used to reimburse the borrower for the purchase and remodeling of a building in Belleville to be used as headquarters for the whole system.

The four REA loans to this borrower totaling $1,724,000 will make possible new and improved service to 3,655 subscribers in Kansas and Nebraska. Of the proposed 13 exchanges, Courtland, Haddam and Morrowville are in operation serving about 700 subscribers in those communities.

Carl Travers is president and manager of the American Communication Co.

•

Chisago City (Minn.) Telephone Co.; $141,000, second loan (May 23).

With these funds, the borrower plans modern service for 367 farm families and other rural subscribers in an area adjacent to its Chisago City exchange. As a nucleus, the company proposes to acquire the Lindstrom exchange now operated by the Northwestern Bell Telephone Co. This exchange now provides magneto service to 326 subscribers.

Present plans of the company include a new automatic central office in Lindstrom.

With the two REA loans totaling $516,000, the company will be able to offer new and improved service to 1,287 subscribers.

Ernest H. Strand is president and Lambert J. Greene is manager of the Chisago City company.

XUM

arouse powerful opposition from the farm block. In fact, this correspondent does not think the administration will be able to put its ideas over. Democratic Senators Gore (Tenn.) and Humphrey (Minn.) viewed this new offshoot of the "tight money" policy as a blow to farmers and a boost to inflation. And Senator Thye (R., Minn.) said he feared the plan might cut off loans to some rural electrification groups.

Senator Williams (R., Del.), on the other hand, said the White House proposal "makes sense to me." He noted that some college housing loans and some farm home loans also would be affected.

Senator Thye said, in an interview, that he feared the proposed legislation would cut off loans to marginal REA groups, affected by scarcity of customers and long-line hauls. Senator Gore said the administration's proposal "is an attempt to justify one wrong by committing another error."

"In the first place," Gore continued, "there is no logical reason for the high interest rates this administration has foisted on the country. In the second place, there is no justification for singling out again the REA for injurious treatment. The people of the country must realize what is happening to them and demand that Congress break the grip that big money now holds over them."

Sentor Humphrey said the administration ought to be using its power to lower rates on the money the government borrows rather than to increase them on loans it makes. Clyde Ellis, general manager of the National Rural Electric Cooperative Association, protested that a rise in interest rates would increase the cost of power to farmers and hamper expansion of rural electrification.

AEC Sells Richland Plant

The Atomic Energy Commission (AEC), which has been operating the government-owned telephone property at Richland, Wash., ever since it was established to serve the government's atomic energy plant base, has sold it to a private company. The announcement was made last month by both the General Telephone Co. of the Northwest and the AEC Hanford office that General had purchased the telephone property at Richland.

Nearly six months ago, negotiations were started between the AEC and General Telephone of the Northwest for the sale of the properties. The final figure was nearly 2 million dollars. To be exact, according to AEC, the price of the property was $1,965,-670. The transfer includes land, buildings, trucks, general office equipment, outside plant facilities, wire, cable, and other assets.

General will take over operation of the telephone property on July 1. Employes of the telephone unit of General Electric will be offered employment by General Telephone of the Northwest, but it is not known how many of the approximately 25 workers will take General Telephone jobs.

Negotiations opened on Dec. 13, and teams headed by M. L. Myrick of General Telephone and J. I. Thomas of AEC have been working steadily since. General will add 7,600 telephones in acquiring the Richland system, boosting its total to 72,000 in Idaho, Washington, and Montana.

TV Movies and the FCC

Federal Communications Commission Chief Examiner, Col. James D. Cunningham, lowered the boom on seven New York television producers late last month when he ordered them to supply the FCC with records concerning their operations. The producers who make film for TV contended that their activities are not subject to the Communications Act and any subpoenas of their confidential business records by the FCC exceeded its authority.

Colonel Cunningham ruled otherwise, however, and ordered the New York film makers to obey the subpoenas and appear before the FCC. There probably will be litigation in court to decide the legal point of whether they really had to take any such orders from the FCC.

The subpoenas originally were issued on Apr. 23 in connection with the FCC's study of radio and television network practices. They called for appearances, with records, at a public hearing in New York City on May 1, at which Colonel Cunningham was authorized to preside.

None of the seven appeared. Instead, their attorneys challenged the FCC's power to subpoena the records involved, described as confidential. They contended, among other things, that the program producers were not licensed by the FCC and not under its jurisdiction. Colonel Cunningham heard argument on motions to quash the subpoenas. He ruled that the subpoenas were completely valid and that the matter of licensing was "without significance." Under the Communications Act, the FCC may refer instances of disobedience to its orders to the federal district attorney for further action, including contempt action if necessary.

The Apr. 23 subpoenas were addressed to Harry Fleischman, president of Entertainment Productions, Inc.; Ralph M. Cohn, vice president and general manager of Screen Gems, Inc.; John L. Sinn, president of Ziv Television Programs, Inc.; Harold L. Hackett, president of Official Films, Inc.; Michael Sillerman, executive vice president of Television Programs of America, Inc.; Charles Miller, secretary of Review Productions, Inc., and David Sutton, vice president in charge of MCA-TV, Ltd.

The chief examiner noted that Mr. Sutton had not been served personally, but that his company had been served through another of its officials. For slightly more than a year, the FCC has been investigating network policies and practices for the announced purpose of determining whether they "foster or impede" the development of a competitive broadcasting industry.

"Taxpayer, Tenn."

Senator Lister Hill (D., Ala.), who holds the undisputed title of father of the REA telephone loan act in the Senate, allowed last week that he was also father of legislation to authorize more flood controls for the Tennessee Valley Authority (TVA). At a closed session of a Senate Public Works Subcommittee, Senator Hill said he felt very kindly toward TVA on account of the recent naming of a little town near Muscle Shoals, Ala. The name of the town will be "Lister Hill, Ala."

Senator Gore (D., Tenn.) congratulated Senator Hill and said, moreover, that it was high time TVA named a city in Tennessee in honor of "Albert Gore"—considering all that Gore had done for TVA in his state. This brought a rousing voice of approval from his colleague, Senator Kefauver (D., Tenn.). Senator Gore added that TVA ought to go further and name a town for "Estes Kefauver." At this point, a self-confessed "Damn Yankee" from up North, Sen. Norris Cotton (R., N. H.) got into the act and said the whole South would be ungrateful if they did not name a town after him. "Where would the South be today without Cotton?" he asked rhetorically.

Nobody had an answer for that one. But this correspondent, who was sitting outside waiting for the great men to emerge with news of what they were going to do about more money for TVA, got to thinking over this name-calling business. Why has it never occurred to the TVA or the state of Tennessee to name a town after the "Taxpayer." After all, where would TVA be today if it were not for all of the rest of us taxpayers. Some such recognition as a town named "Taxpayer, Tenn," would not only be deserved but it also would be about all a good many taxpayers

(Please turn to page 48)

Locating Opens in Distribution and Parallel Line Wire

By DANIEL S. SEITZ*

WHEN LOCATING faults in rural and urban distribution wire, methods other than those commonly used for shooting trouble in paper lead and plastic cables must be employed so as to avoid unnecessary and excessive insulation damage and repairs.

Solid shorts, crosses or grounds can usually be located by the conventional tone and exploring coil method.

Because rural and urban distribution wire does not have a metallic shield and/or plastic jacket the method illustrated by *Fig. 1* can be used to locate opens without in any way disturbing the insulation except to repair the actual trouble.

Running down an open by puncturing the insulation with the needle of a test clip in order to contact the conductor will create a cause for subsequent trouble unless each and every one of these punctured spots are properly patched with the same tape used for insulating the splices.

Testing by cutting through the insulation with a knife or razor blade should never be done because it might result in nicking the wire.

Then moisture reaching the conductor by way of the cut in the insulation, together with battery on the line, will cause an electrolytic action and eventually result in another open.

Running down an open in rural or urban distribution wire by cutting or puncturing the insulation for testing usually results in numerous patch jobs before the exact open spot is found, which requires time and leaves the insulation in a less sound condition than before patching.

A relatively low volume tone (Bug) such as commonly used for pair identification in cable work, together with the proper amplifier and probe constitute all the equipment necessary to locate opens without puncturing insulation.

The tone circuit is shown by *Fig. 2*.

The following is a list of parts required to make up a tone:

One 3-volt battery buzzer.
Two .5 MF low voltage condensers.
One toggle switch.
Two dry cells.
Two pin jacks.
One two-conductor cord.
Two test clips.

The transistor amplifier shown in

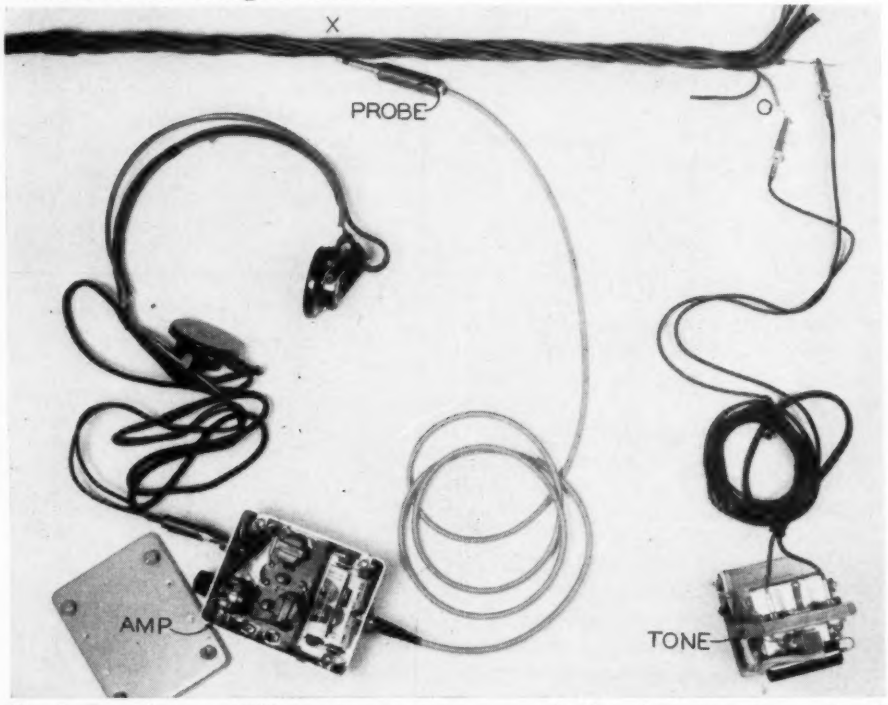


Fig. 1. Transistor amplifier and tone arrangement for locating opens in rural and urban distribution wire.

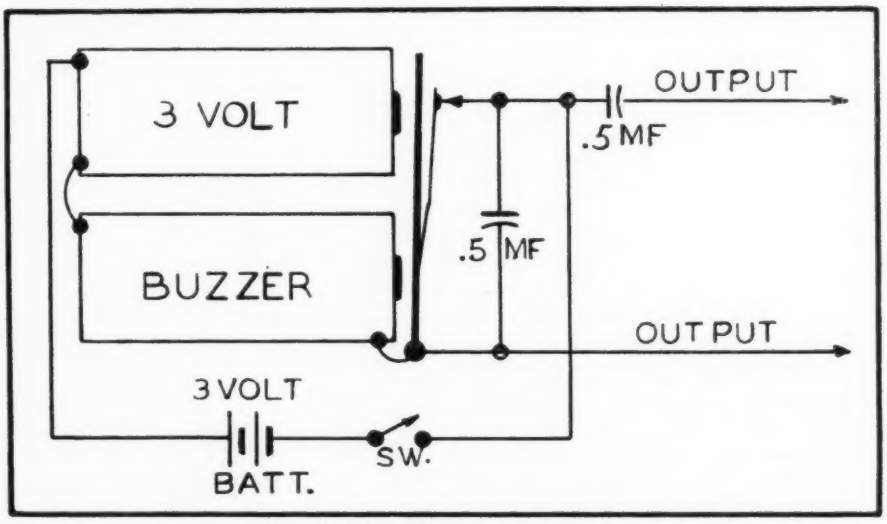


Fig. 2. Identification tone circuit.

*Mr. Seitz is a former chairman of the USITA Plant Committee and now a cable consultant.

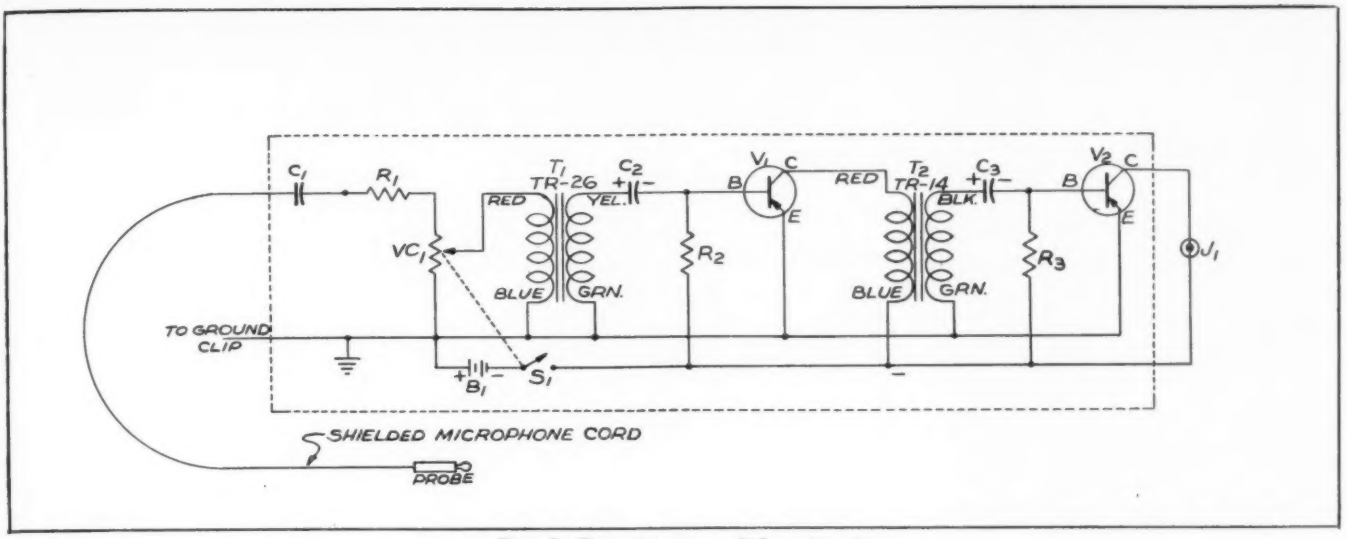


Fig. 3. Transistor amplifier circuit.

Fig. 1 weighs less than 12 ounces and has a clip for attaching it to the troubleman's belt or pocket.

Only two pen-light batteries are required to power this amplifier and the battery drain is approximately 2 mils which means long battery life.

The head phones are 1,000 ohms each and are connected in parallel.

A single conductor shielded microphone cord connects the amplifier to the test probe.

The probe shown in *Fig. 1* is a modified two-conductor switchboard plug, from which is removed about one-quarter inch of the sleeve adjacent to the tip of the plug to provide additional pick up.

The tone for locating opens in rural distribution wire may be connected either of two ways as shown by *Fig. 4-A* and *4-B*. The important requirement is that both wires of the open pair be shorted and grounded at the distant end. The tone can then be heard along the wire between the tone and the open, for example O to X in *Fig. 1*.

Beyond the open, the tone volume heard will be greatly diminished. When using the probe shown in *Fig. 1* to listen for the tone a low volume, reduced tone will be heard on all the pairs.

Actually, being able to hear a low tone on all pairs, but a loud tone on the faulty wire to which the tone is actually connected is a distinct advantage because one can be sure that the tone has not ceased operating while he is trying to run down the trouble.

Opens in parallel line wire can be located by connecting the tone as shown in *Fig. 4-C*, being sure to short and ground the distant end of the wire. A driven ground or guy wire will be satisfactory in the event that no other

(Please turn to page 44)

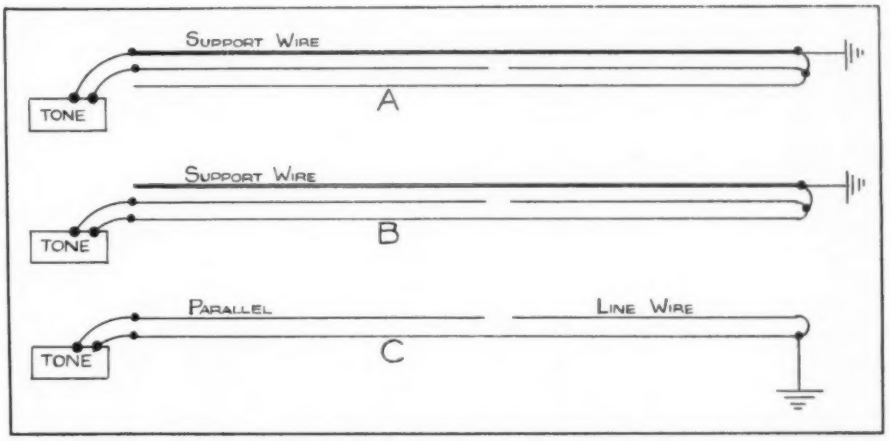


Fig. 4. Tone connection for locating opens in rural or urban distribution and parallel line wire.

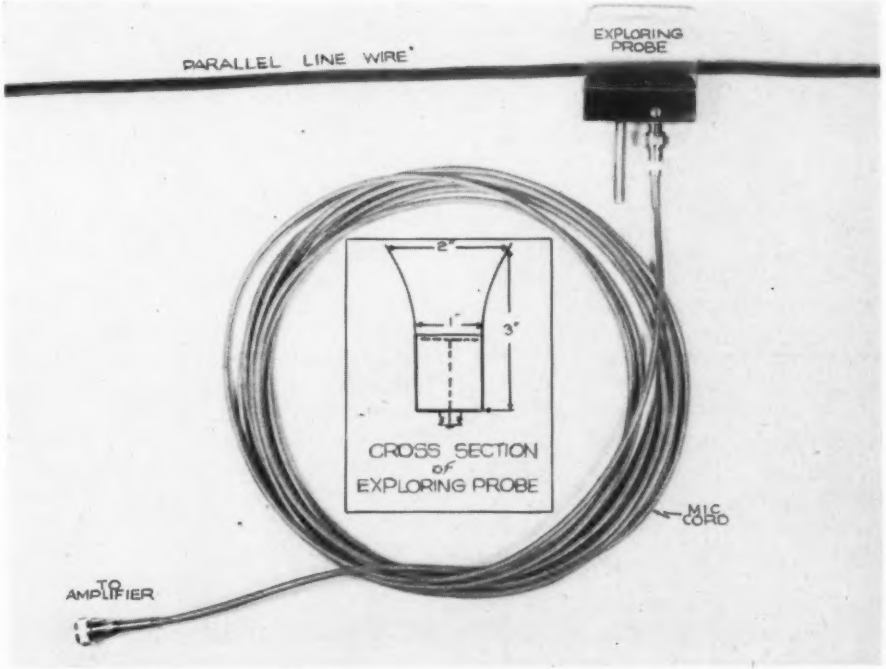


Fig. 5. Exploring probe for use on rural distribution, parallel line or twisted pair drop wire.

Demand Increasing for Special Uses of Telephone Facilities

By B. W. FORD*

SOME people still consider all telephone service as exchange in nature and recall the early days of the telephone in terms of the small switchboards—in the larger towns the boards were sometimes operated by boys who occasionally used vile language and in the smaller towns, it was located in the back end of the general store or in someone's kitchen.

However, today our business is changing, more emphasis is being placed on the *special use* or *private line*. As a matter of fact, the private line came first and the telephone's first use was for what we now consider a special use. When Alexander Graham Bell spoke to Mr. Watson, they were using opposite ends of a private line.

I am supposed to be a salesman, at least, a staff salesman, and after analyzing the requirements of Bell and Watson, I believe they were using the right service, as their problem was to "transmit intelligence between two points or individuals."

As you know, private lines were installed to care for the point-to-point requirements of many persons. It wasn't long, however, until some people wanted to talk with others than their wives or offices and the "exchange" or interconnection of private lines became a necessity and, of course, mothered the invention of the switchboard.

As I am not much of an historian, the foregoing is about the sketchiest history of the invention and development of the telephone that you will ever hear. I did want to mention the early incident, however, to show that the so-called "special uses of telephone facilities" have always been, and always will be, important to our customers and to us. In fact, one of the most important characteristics of *modern* telephone facilities is their readiness for use to perform many different functions.

The present telephone system in the United States, consisting of about 60 million telephones, was engineered, constructed, and is operated by many different telephone companies. The successful integration and interrelation of these many companies, no doubt, has contributed to the pre-eminence of our nationwide system. Those who planned and built the system realized this important fact—*the customers should not experience differences in the quality of service even though it is handled by different companies.*

During 1956, over 700 million long distance calls involving more than one company were handled, and I doubt that a recognizable percentage of the callers were aware of the multi-company nature of the service they were using. This achievement can be considered as the fruit of the cooperative effort of the many companies involved.

During the past 10 years, telephone growth in this country has doubled—when you measure it in terms of the number of telephones that can be connected to any other telephone. Message toll revenues have increased two and one-half times. But what has happened to the granddaddy of the business, the private line or special use of communication facilities? During the same period, special use business has *quadrupled.*

I want to keep statistics to a minimum, but I believe that a few more are necessary if we are to properly appreciate this remarkable growth. I think that revenue figures—money—is one thing we all understand and fortunately all of these figures are at least in the millions because today we seldom see a figure below a million.

During the period from 1946 to 1956, Bell System gross revenues from private line service had a phenominal growth—from 49 million dollars to 198 million dollars. These figures include only revenues from private line telephone and telegraph and program audio and video services.

My friends in our transmission and assignment groups tell me that in the city of Chicago, 50 per cent of many of the inter-office cable paths are assigned to special services. In state area, more than 70 per cent of some cable paths are assigned to special services.

Ten years ago, in the state area, we had about 94,000 main line business telephones and about 5,000 special service lines. The ratio was 5.3 per cent special services to business lines. Today the ratio is 10.6 per cent. The number of business lines has increased 50 per cent in 10 years, but the number of special service lines has tripled.

Under our system of regulation, our industry is the only one that can provide the public with a telephone that can be connected to any other telephone. In the special use field, however, we are not alone and let's not forget it. During this same period mentioned above—1946 to 1956—Western Union's leased line revenues went from 3.7 million dollars to 30 million dollars. While the Bell System's private line revenues quadrupled, Western Union's revenues increased 10-fold. Furthermore, the growth in special services is not confined to communica-

*Mr. Ford is Staff Sales Manager of Illinois Bell Telephone Co. He presented this address at the recent Illinois convention.

XUM

tion common carriers such as Western Union and telephones companies.

You are probably familiar with what we in the Bell System call the "right-of-way" (ROW) customer. He is the fellow who has his own right-of-way—a power company, a pipe line company, or a railroad. He has a tremendous requirement for special services and he has had his own communications plant—mostly wire—for years. When he started out, telephone companies were probably happy to let him provide his own communications, as he undoubtedly operated in isolated areas—and besides he didn't want just a telephone that could be connected to any other telephone. His requirements were like those of Bell and Watson. In addition to a regular telephone, he wanted facilities to provide "transmission of intelligence between two points or individuals."

So the ROW customer preceded the current "do-it-yourself" trend and built his own plant to provide the communications services he wanted—and he is still doing it. He belongs to an organization devoted to dramatizing the advantages of customer ownership and our efforts to provide all or part of his communications are not always received with open arms.

The right-of-way customers have been and are expanding their privately-owned facilities at a rapid rate. Due to their requirements for multi-channel facilities, point-to-point radio or microwave has had a special appeal to them. This is not the place to discuss the relative merits and costs of wire line plant versus microwave. But let's make one point clear as far as the transmission of intelligence is concerned and that is—wire will do anything that microwave will do. As a matter of fact, wire offers possibilities greater than radio. Have you ever considered what the picture would have been if radio had been invented or discovered before wire and for some time had provided the only means of communications—and then later someone discovered a way to send the sound waves by wire? What a wonderful thing that would have been. The use of wire would have opened vast new areas of communications which radio could not have touched.

It is estimated that presently-authorized private microwave systems provide about 27,000 route miles of service, or the equivalent of 150,000 voice channel miles. When these systems reach full capacity, they will provide 460,000 voice channel miles. Annual revenues for comparable telephone company services would be in the order of 7 million dollars for the 150,000 voice channel miles and 20 million dollars for the "full-blown" capacity of 460,000 miles. Remember, this involves only the ROW customers' microwave operations. I have heard it said that to duplicate the existing wire line services owned by these ROW companies would require a capital investment as large as that invested in the Illinois Bell Telephone Co., which is in the neighborhood of 1 billion dollars. Some of these privately-owned facilities, microwave and wire, are in our companies' territory—our back yard—in competition to our services.

Have we been so busy looking out for all the phases of our switchboard business such as held orders, regrade requests, and toll facilities that we haven't kept in touch with the expansion of new uses of our facilities? Have we been unaware of these growing communications needs while others, our competitors, have been "making hay"?

What has brought about this increase in the need for special telephone services? What is behind it? Why has the public suddenly *expanded its requirement for special uses of telephone facilities.* If we consider some of the factors causing this growth, I believe we will see that it fits logically into our over-all expanding economy. And, also, let's examine the possibilities of additional functions that our telephone facilities will have to perform.

Not too long ago, we had a second industrial revolution, which I think was sparked by the increased use of the machine tool, however, through it, the *productivity* of the individual worker was vastly increased. Only by increasing individual production can industry provide the vast amount of fairly priced goods and service that we demand today.

For every manufacturing or servicing operation, there seems to be an opposite, but not equal, clerical or paper work operation. For a number of years, an office got along with a typewriter and an adding machine representing its only mechanical equipment. Later, there had to be a bookkeeping machine and, today, no office is modern unless it has numerous machines, or one which combines the functions of the typewrite, adding machine and billing machine.

It has been estimated that, unless paper-work is greatly simplified or mechanized, by 1965 there will not be sufficient supply of office employes to take care of it. Paper-work—like taxes—never seems to lend itself to reduction so the answer lies in mechanization.

Hand-in-glove with mechanization is decentralization of industry. Both will require new uses of existing, and yet to be developed, communications facilities. In general, business concerns are not adding to their home office or home factory building. They are selecting sites 50, 100 and perhaps 1,000 miles away—maybe they have exausted their local labor supplies—maybe their new locations put them in a better marketing position, transportation-wise—maybe they just don't want all of their eggs in one basket, but for one reason or another, they are decentralizing.

This decentralizing alone increases the need for communication facilities to interconnect the branches for a most important purpose—to "transmit intelligence between two individuals or point."

You all know that even with decentralized units, many functions of business can be better and more economically handled on a centralized basis.

I mentioned earlier that perhaps we need a machine that combines the functions of the typewriter, the adding machine, the bookkeeping machine, the numerous filing cabinets, etc., and which requires no one to operate it.

There is such a machine, it goes by several names, such as Univac and Digital Computer. It is costly, but it has a tremendous capacity. For illustrative purposes, let's assume for a minute that we are all members of a board of directors of a growing business and we have an acute case of "computeritis."

We scatter our branches all over the country, some in Independent territory, some in Bell territory. However, these branches are not completely autonomous units because back in the home office we install a machine that will do many things for the branches.

It will give us extreme accuracy and speed. It's capacity is so great that it staggers our imagination. It costs a lot of money, but because of present conditions we must have it. Now, by installing, or considering the installation, of this machine, we have *expanded* the *requirements* for special uses of communication facilities, because we need a means whereby all of the bits of information can be sent from the branches to the machine in our home office, and after the machine has digested these bits of information it can send it back to the branches as requested—and in a form that is usable.

For example, our business might be a large insurance company with many territorial offices, each with its elaborate and costly policy records. We install the computer machine at our home office. Its memory tapes are capable of storing all policy information for the whole company. The only other thing the machine needs is the special use of telephone facilities so that the insurance company branches,

wherever they may be located, in either Independent or Bell territories, can supply information on new policies to the "home office' machine and receive information on a "when wanted" basis from the machine.

Don't think that this type of special use of telephone facilities isn't going to grow. It is and it has to, because business cannot continue to grow under the present "horse and buggy" concept of office and paperwork.

Mechanization, automation, integrated data processing, paper simplification—call it what you will—all mean increasing the productivity of the individual worker."

Let's use one of our ROW companies as another example.

(These people are pretty well impressed with their ability to care for their own communications problems, but little by little we are convincing them that communications should be handled by communication companies.)

A pipe line company has a 16-inch trunk line running from Hammond, Ind., to Detroit and Toledo. This line delivers to Detroit and Toledo products produced in three refineries within a 5-mile radius of the Hammond pipe head. Feeder lines run from each of the three production points to the pipe head and the problem confronting the company is to control, from one point, the operation of the many valves, and to read at one point, the many meters that are required to indicate pressure and flow in the numerous storage tanks and pipes which could feed the main line.

I don't want to get too technical here, but I should explain that the most complicated of all pipe line operations is the products line. Until a few years ago, two different products could not be handled in the same pipe line—at the low pressure then in use—because of excessive mixing of the products.

An oil company experimenting in high pressure pumping found that mixing is minimized when adequate pumping pressures are used. Thus, batches (called tenders in the trade) of gasoline, fuel oil, diesel oil, and other products can follow each other along the same line. The mixed slug between products, called the interface, has been so minimized that it is no longer an economic problem. In practice, this interface is not wasted, but is included in one batch or the other.

You have all seen refineries with their fields of tanks full of different products and you can visualize the problem involved in channeling the different products of three refineries into one 16-inch pipe line, separating them at the other end, and delivering them to the three different customers.

Yet, through the use of some 70 metering and control channels, a man sits at a console in Hammond, Ind., and controls the entire intake operation. How? By making a special use of facilities provided by the telephone industry. It would be useless to guess how many men and message toll calls would be required to operate these myriads of controls by hand. The operation would not be possible without the special use of communication facilities—the private line—the service between two points.

I could cite other examples of industries in which there is an expanding requirement and demand for special uses of communication facilities—one of which is the power industry. The operation of a power system is centralized at the load dispatching center. With an hourly load forecast, each day's operation is planned. Power plants are operated to take advantage of the most economical balance between available water power and steam power within a system, as well as power purchased from other systems through interconnection. As you know, today power companies do not operate independently or alone. Their lines, like telephone lines, are interconnected. The power used in any town, at a given time, may be coming from a generating station owned by another company hundreds of miles away. This interconnection enables the participating companies to even out the production and consumption peaks not only in their own territory, but all over the system.

The load dispatcher of the power company requires communications with power plants, substations, other dispatchers and with his administrative headquarters. He must also have control and metering circuits to various points in the system, which may be located in either Bell or Independent territories, so that he can operate controls like the man at the pipe line console. There is no other way—he must have communications facilities that lend themselves to special uses, and rest assured either the telephone industry will furnish them or someone else will.

I have mentioned only a few of the factors bringing about this need for special uses of telephone services, but there is one which will influence this need in the future—*the existing and increasing shortage of people,* which means we will have to get more done with fewer people. This shortage of people effects all types and sizes of business, including telephone companies.

We telephone people think we are among the leaders in mechanization or automation. The telephone industry doesn't take a back seat to anybody when it comes to switching telephone calls, but perhaps we have been a little tardy when it comes to simplifying or mechanizing our paper work. We will have to get into it though. I understand that already one of the larger Independents is now in the process of installing a computer at a central location, which will be connected to all outlying units by private lines. The various offices will send information into the computer over these private lines and I am told the computer will write service orders, assign cable pairs, possibly order station equipment, print the Address-o-graph plate for billing, and ultimately it may print and mail the bill.

It is not only the large company that is running out of people—it is the entire business world. The need to increase the productivity of the individual is being translated into demands for special uses of communication services, not only from power and pipe line companies, but from railroads, toll road authorities, newspapers, broadcasting companies, government agencies, and just plain Joe Doakes. Likewise, the great variety of uses to which our facilities can be put is of the utmost importance in our nation's defense, which of course, is always at the head of the list.

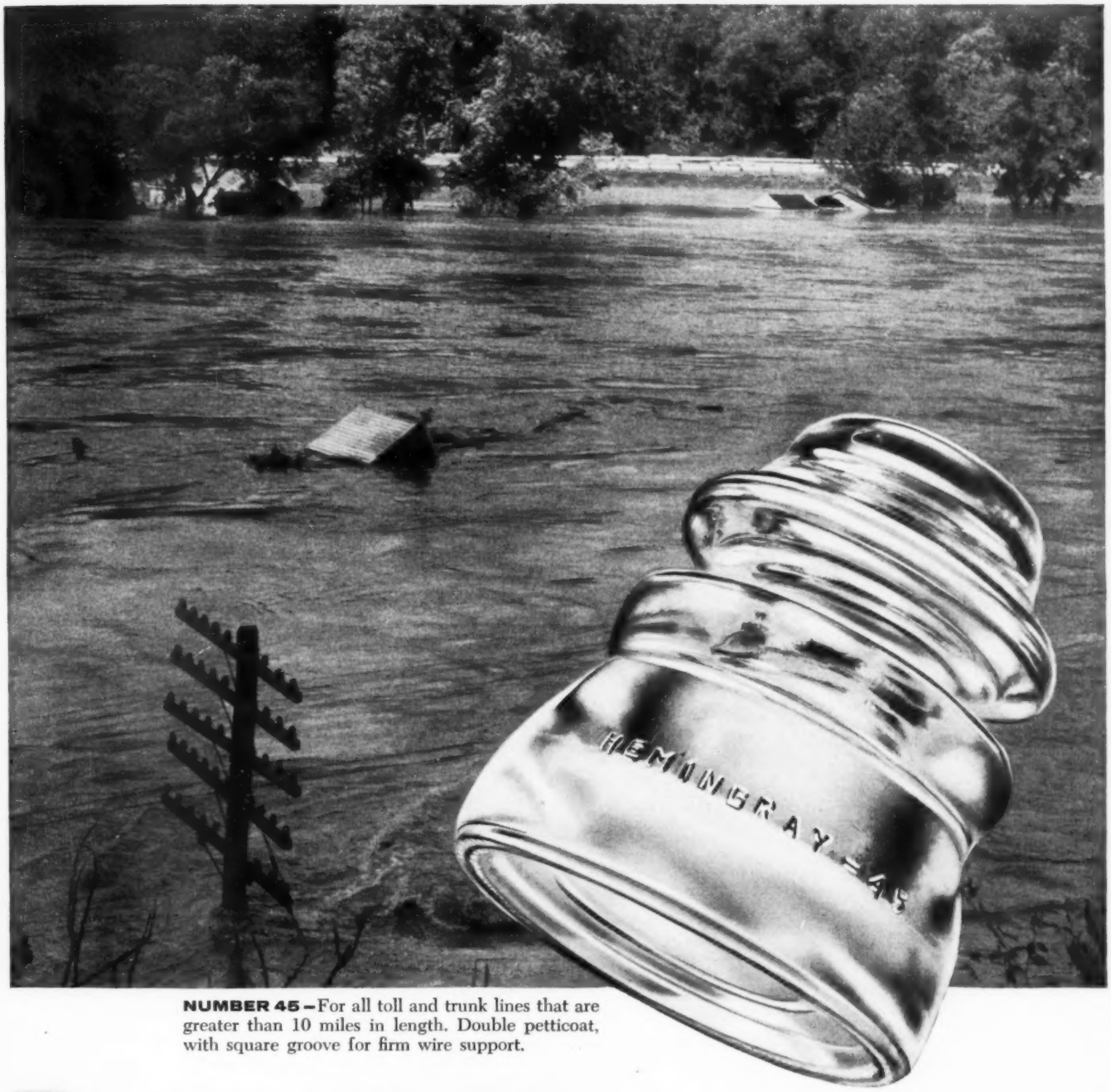
You don't have to be in a big city for your merchant to want someone to guard his place of business, and since people are in short supply—especially policemen—it is economical to do this "hawkshawing" with burglar alarm channels from a central location.

The radio station in your own town either has decided, or soon will decide, to meter and control his transmitter from the studio through the use of communications facilities, because it is getting more and more difficult to obtain and pay a radio engineer to sit in that little house out by the tower and record the registration that the FCC requires the station to keep. The station has a man at the studio that can do it if the telephone company will provide the communication facilities it needs.

To meet the problem of increasing the productivity of their people our customers are not only expanding their requirements for communications facilities, but they are also requesting new arrangements of facilities. In addition to the common or garden variety of service such as private line telephone and teletypewriter service they are requiring channels for such services as:

(1) Facsimile—A means by which

(Please turn to page 44)



NUMBER 45—For all toll and trunk lines that are greater than 10 miles in length. Double petticoat, with square groove for firm wire support.

Dependable ...in emergencies

You have to depend on your equipment when rampaging nature puts communications systems to their severest tests.

You *can* depend on Hemingray Glass insulators to stand up under severe conditions and provide the service you need. Strong, uniform high quality Hemingray insulators since 1870 have been the world standard for quality . . . have carried most of the world's overhead telephone and telegraph wires.

Hemingray has pioneered many insulator developments, to keep pace with the requirements of improving communications systems. For prompt delivery of what you need . . . when you need it, you can always depend on Hemingray.

Hemingray Glass insulators are a product of Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio.

HEMINGRAY INSULATORS
AN (I) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

backed by years of experience and research...

GENERAL

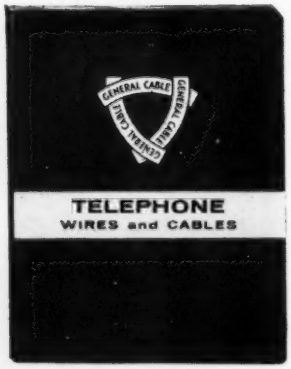
the most complete line for all your cable needs

The next time you order cable — specify **General Cable.**

For more than 70 years, General Cable has been supplying and developing the most complete line of wires and cables needed for inside and outside plant installations. These products are manufactured in nine strategically located plants to meet the needs of the entire Independent Telephone Industry.

When you ask for General Cable, you assure yourself of the best in wire and cable.

Just as every General Cable product is backed by years of Research, everything else that Leich handles, meets the same rigid tests. You'll find it profitable and to your advantage to let us help you with all your supply problems. The complete selection, fair prices, guaranteed products and a genuine appreciation of your needs are all part of the way Leich does business. Next time you order supplies, try us!



The new General Cable catalogue is now available. It's packed with helpful data on all their wire and cable products. For your copy ask your Leich salesman or write to Leich Sales Corp., 427 West Randolph St., Chicago 6, Illinois.

LEICH

LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6, ILLIN

CABLE

LEAD COVERED CABLE
Quadded and composite types. Designed for long distance transmission. Available in 13-16-19-22 AWG.

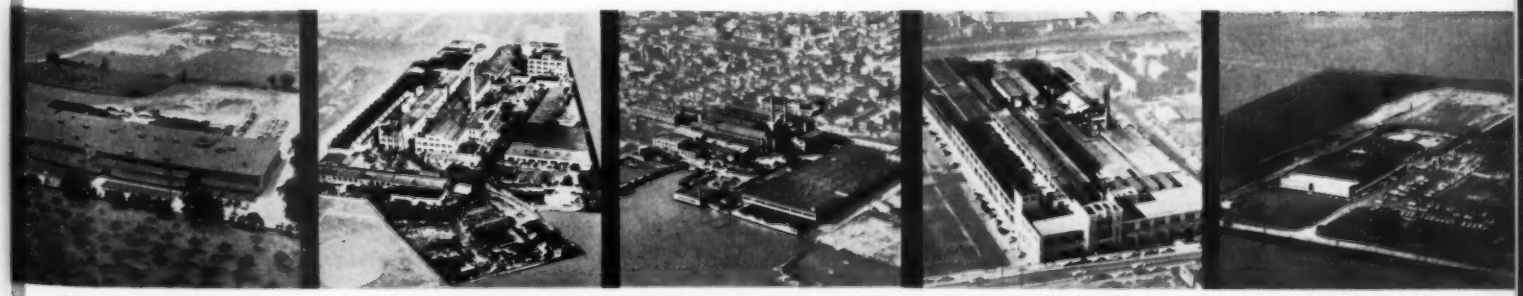
PAPER-INSULATED LEAD-COVERED EXCHANGE CABLE
Including tape armored jute protected and submarine cables. In all sizes and gauges.

THERMOPLASTIC AERIAL AND DUCT CABLE
Lighter weight and easier to install. Also features high quality transmission and excellent in-service stability.

RURAL DISTRIBUTION WIRE
Excellent transmission characteristics. Can be applied directly to the pole or to underside of existing crossarm.

INSIDE WIRING CABLE
Thermoplastic type. For installations requiring a considerable number of inside wires. Fully color coded.

TEXTILE TERMINATING CABLE (TIP CABLE)
Available in 101-606 prs. In standard color codes and sizes.

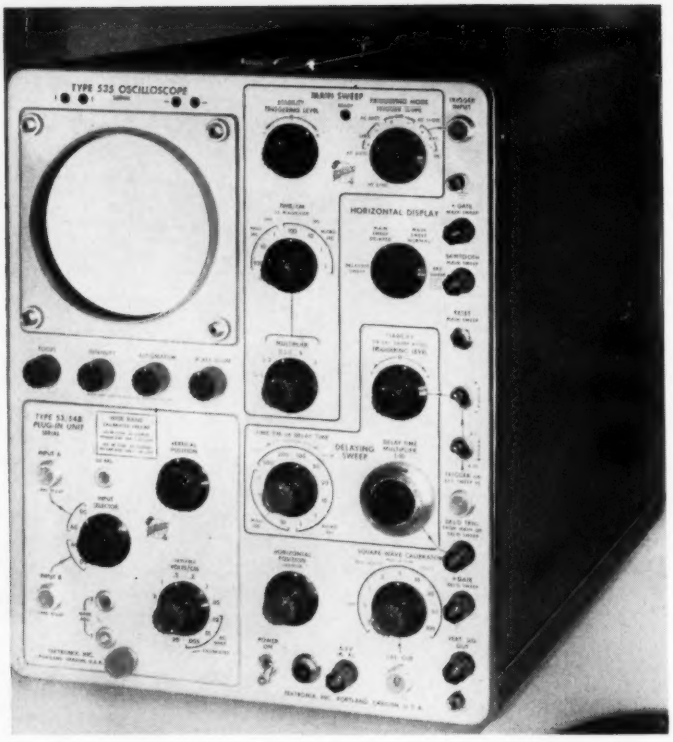


Tampa, Florida *Bayonne, N. J.* *Perth Amboy, N. J.* *Emeryville, Calif.* *Monticello, Ill.*

manufacturers of telephones, switchboards and related apparatus since 1907

PACIFIC COAST: 11401 WEST PICO BLVD., LOS ANGELES 64, CALIFORNIA SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS

GENERAL SYSTEM



One of the aristocrats of the cathode ray oscilloscope family is this Tektronix Type 535. This instrument features plug-in amplifier units which adapts it to a number of different uses. The knobs and terminals on the panel include horizontal display (for normal, delayed or external sweep), triggering mode (ac fast ac slow and dc), trigger slope (selects source of trigger) stability, triggering level (picks part of waveform where sweep triggers) time/cm (selects timing capacitors) multiplier (for sweep speeds) 5X magnifier, gate (supplies 20-volt positive pulse) sawtooth (supplies 150-volt sawtooth wave externally). Similar controls and circuits are provided for the delaying sweep. Other controls regulate a square wave calibrator, a vertical signal output, intensity, focus and astigmatism.

Use of the Oscilloscope in Telephony

By **HAROLD B. McKAY, TELEPHONY'S Electronics Editor**

PART 2

ESSENTIALLY, a cathode ray oscilloscope must consist of the cathode ray tube and a power supply for the voltages required by the tube. In addition, there usually are amplifiers for both horizontal and vertical input circuits so that weak signals may be brought up to the point where they will deflect the cathode ray beam in the tube.

A single dc voltage applied to a cathode ray tube plate would merely move the dot produced by the electron beam either up or down, or from side to side. An ac voltage would make either a vertical or horizontal line trace on the tube face. In order to spread the trace out so that it forms a picture or drawing of some sort, two voltages are necessary, one horizontal and one vertical.

This was illustrated in the first article of this series (TELEPHONY) in the presentation of Lissajous figures. However, if the test to be made involves only one voltage, this is usually placed on the vertical plates of the "scope." In this case, an internal oscillator provides the voltage for horizontal deflection of the beam. This voltage is under control of a coarse and fine frequency adjustment on the panel of the instrument. It may be known as the time base or sweep frequency. When tests are made with the scope they are usually made by watching the applied voltage, as it is seen when spread out by the internal sweep voltage.

To get a pattern which stands still on the screen, the voltage to be tested must be in step with the internal sweep voltage. Either may be a harmonic of the other; they don't have to be the same frequency. In fact, many "scopes" do not have horizontal sweep rates higher than 30 kilocycles. Normally the sweep rate is set at some submultiple of the frequency being observed.

The horizontal oscillator is usually of the multivibrator type, which means that it can be synchronized or triggered by another alternating or pulsed voltage. A terminal post on the instrument marked "external sync" may be used for this purpose. In other cases, an option between "recurrent" and "driven" sweep may appear on a switch on the instrument. A recurrent sweep continues to give a horizontal line in the absence of an input signal to be measured. A driven sweep appears on the screen only when triggered by a pulse from the voltage to be measured.

Bandwidth

The bandwidth of the amplifier in the "scope" is important in some applications. In television, a bandwidth of 5 megacycles may be required; other

applications may require less. In any event, wave shapes having many components and harmonics will be rendered more faithfully on "scopes" with wide-band amplifiers. Other features of a "scope" amplifier are the maximum or top frequency to which it is useful, and its sensitivity, that is, how small a measured signal it will handle.

Because an oscilloscope can be used as a voltmeter, a useful device for use with the instrument is a voltage calibrator. This may be a separate accessory, or it may be a built-in feature. The built-in type is, of course, the most convenient. It avoids trouble in connecting up, and switching in and out of operation. Its function is to supply a standard known voltage for display on the screen.

Thus, an unknown voltage may be displayed on the face of the "scope." Its peak-to-peak amplitutude is noted by reference to the cross-hatched lines which can be part of a mask placed over the "scope."

The measured voltage is then switched off, and the standard calibrating voltage is switched on instead. The peak-to-peak spread of this voltage is then noted, and comparison is made with the space occupied by the measured voltage. From this the voltage of the unknown can be determined. In actual practice, the calibration voltage may be adjusted so that it falls exactly on certain lines on the face of the tube.

For instance, five lines on the mask can be made to represent 5 volts. The face of the tube then becomes a voltmeter, with a line on the mask for each volt.

Electronic Switch

For facilitating such comparisons, an electronic switch is sometimes used. This is a tube device which will rapidly switch the input of the oscilloscope from one circuit to another. Thus two different traces can be made to appear on the screen at the same time for comparison.

Other methods involve the use of long-persistence or "memory tubes" which retain a trace on the face of a tube for a considerable length of time.

Another device used with cathode ray oscilloscope testing is the square wave generator. This is a device which puts out an alternating voltage, the waveform of which has straight sides and a flat top. Electrically such a wave is composed of many different harmonics. Therefore, this wave can be used to test the transmission qualities of a circuit or a device.

If a square wave is transmitted faithfully, as seen on the "scope," it means that the fundamental as well as the harmonics are getting through the system. Failure of either low or high frequencies to get through results in distortion on the waveform.

Still another device is a pulse generator which can produce a pulse of say a half microsecond duration. This can be applied to a transmission line across which is connected an oscilloscope. The pulse will be seen on the scope as a pip or spike at the beginning of the horizontal line. If the line is not properly terminated, a second spike will appear further along the line. This can be used to locate trouble on an open wire line in the manner of the line fault analyzer, a specialized "scope" made by Sierra Electronics, which was described in the Feb. 11, 1956 issue of TELEPHONY.

Some oscilloscopes will have some of these features as built-in items; others depend upon accessory units. Some will generate signals within which can be connected to circuits outside for more elaborate tests. Trigger pulses and delayed sweeps, whereby the sweep may be made to start at a particular part of the wave, are optional features available in some units.

The selection of a cathode ray oscilloscope depends upon the use to which it is to be put. There is no advantage in spending hundreds of dollars for features which will never be used. On the other hand, the absence of needed features will be a handicap.

The next article of this series will discuss the features most applicable to telephone plant.

Freedom a Powerful Example

"In the whole world of ideas the most beneficent and dynamic force since the dawn of history has been man's quest and vigil for freedom. . . . the real dawn of freedom came when, after the Middle Ages, our founding fathers recovered the tablets of the rights of free men. They added to the text of those ancient tablets. Their genius provided safeguards for their preservation. Our forefathers established the principles of freedom so firmly that despite occasional stumblings, this Republic has had a longer life, and a prosperity for its people unmatched by any other nation in history. That turning of the pages of history was the fulfillment of God's purpose that the mind, spirit, and enterprise of men should be free. It gave courage and hope not alone to our people. It lighted an illuminating flame to guide all the waiting and anxious men and women of the earth."—HERBERT HOOVER, *Former President of the United States.*

Donald F. Anderson, General Manager of the Geneseo Telephone Company, Geneseo, Illinois, and Mr. Donald M. Little, the gas station owner on whose property an Alcoa Booth is installed, look on as a trucker uses the booth to report to his express line. Geneseo is 150 miles due west of Chicago on U.S. Route 6. Many of the town's 5,000 residents commute to the nearby Tri-City area of Davenport, Rock Island and Moline.

"SEEMS LIKE EVERYBODY WANTS ALCOA BOOTHS!"

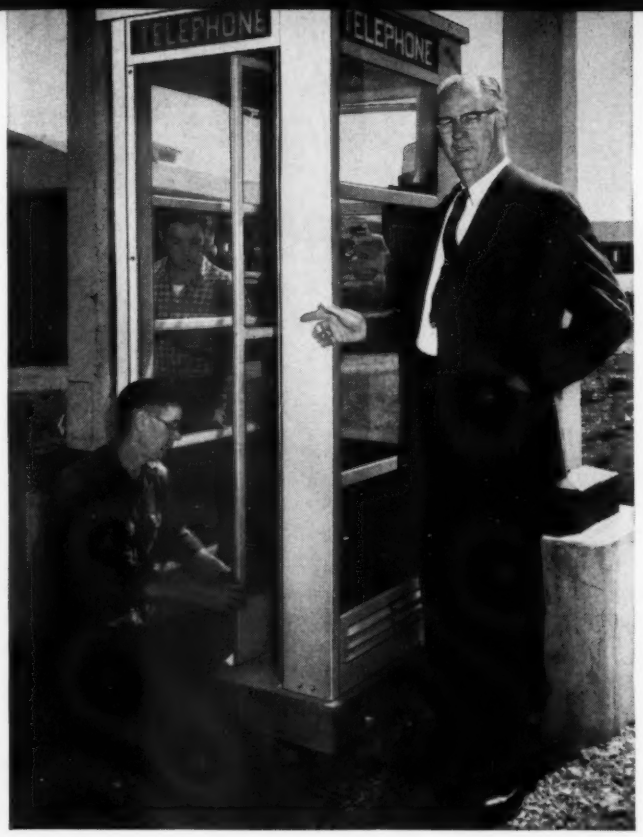
Reports Donald F. Anderson, of Geneseo Telephone Company

"Since our town is located right on U.S. Route 6, we get a lot of transient motorists and truckers passing through," says Donald F. Anderson, General Manager of Geneseo Telephone Company, Geneseo, Illinois. "Local businessmen such as gas station, restaurant and motel owners frequently request that we install an Alcoa® Outdoor Booth on their property. As one service station operator put it when he asked for a booth, 'If we can get 'em stopped, we stand a good chance of selling 'em something'."

Geneseo Telephone Company now operates seven outdoor booths, five of which are of Alcoa manufacture, and plans to add more Alcoa Booths. There has been some door-closing trouble and glass breakage with the two non-aluminum booths, but performance of the Alcoa Booths has been trouble-free.

"As a matter of fact," says Manager Anderson, "before putting up these Alcoa Booths, we were very much afraid of vandalism. Actually, we have had no cases of damage of any kind."

XUM



"ASSEMBLY INSTRUCTIONS ARE EASY TO FOLLOW" . . . says Geneseo Telephone Company General Manager, Donald F. Anderson. "Our men take about four hours to erect a booth. The first one assembled takes the most time. After that, the men hardly need to refer to the instructions at all."

"ALCOA BOOTHS DON'T TAKE UP MUCH ROOM on the property owner's land," says Manager Anderson, "yet the booths are big on the inside. Even when the ladies are shopping and are loaded down with packages, there's plenty of room on the inside to use the telephone."

"WE'RE PUBLIC RELATIONS CONSCIOUS at Geneseo Telephone Company," says Don Anderson, "so we were glad to get a free Alcoa Goodwill Kit with our new booths. The kit contained radio and TV commercials, publicity articles, newspaper ad mats and bill enclosures."

"OUR BOOTHS EARN $75 TO $85 A MONTH on the main road," says Mr. Anderson. "We feel at least 50 to 60% of this is new business that we wouldn't otherwise obtain. The revenue shoots way up in the summertime when tourist traffic through our town is the heaviest." Shown here is cashier, Mrs. Richard King, depositing coins with William H. Bean, bank teller.

GET MORE INFORMATION ON ALCOA BOOTHS. Write for brochure. And ask your jobber how Alcoa Booths can increase your revenue and build customer good will. ALUMINUM COMPANY OF AMERICA, 1690-F Alcoa Bldg., Pittsburgh 19, Pa.

Your Guide to the Best in Aluminum Value

WE CHOSE ALCOA ALUMINUM MILL PRODUCTS
ALUMINUM COMPANY OF AMERICA

THE ALCOA HOUR • Television's Finest Live Drama • Alternate Sunday Evenings

XUM

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

CUSTOMERS keep the wheels of industry turning. Without them, every business would soon fold up and people everywhere would be out of employment.

Customers are people in all walks of life, kindly persons, irritable folk, demanding individuals, etc. In the telephone industry, they more frequently bring a smile to the operator's lips than a frown to her brow.

An elderly woman, whose interests and activities increased as time was running out, had been giving her telephone a real whing ding until progress caught up with her in the form of the automatic system. She protested bitterly that she could never learn to use the new-fangled thingamajig. To prove how simple dialing really is, the telephone man suggested she try some numbers she frequently called. She thought of her broker, but the number had been changed at the time of the conversion. After consulting the directory and a good deal of prompting she got the number and decided somewhat reluctantly it might work out. Two weeks later her son got a call at his office from an exasperated senior partner at the brokerage firm. "Jack," he sputtered, "I have relayed your mother's grocery orders. I have made her appointments with the hairdresser. I have even transmitted her acceptance of three invitations to tea parties, but now I draw the line. I positively refuse to solicit contributions for her church bake sale. Either she learns to dial some number besides mines or she gets herself a new broker."

A public telephone customer in a small town didn't have enough money to pay the overtime charges on a long distance call. The operator called the mayor, who ran a store near the telephone booth. The mayor investigated. The man had gone but his false teeth were there on the shelf. The man appeared next day to correct the matter but, forgetful fellow that he was, forgot to claim his teeth. First person on record who ever took out his teeth to chew the rag. Some years ago a friend of mine in the telephone industry went for a boat ride on the lake. An amusing story was told and she laughed so heartily, her upper denture fell into the lake. Needless to say, the denture was not recovered. The new one she had made was much more becoming so—her loss was a personal gain.

A resident of the rural areas went to the metropolis with his nephew and got lodged in a fancy hotel. He didn't exactly feel at home but it was comfortable. He settled down in an easy chair and whipped out a copy of "The Country Gentleman." The telephone rang. It was just a ring so he paid no attention. It didn't occur to him that his nephew, who had gone out to do some errands, might be wanting to reach him. But Nephew was resourceful. He knew Uncle was there, and all of a sudden he figured out why the old gentleman didn't answer. "Give him a long ring and two shorts," he told the operator. Uncle never answered anybody else's ring at home but he always answered his own promptly. This was his ring. He answered.

Just to prove people are funny, a housewife panted up the basement stairs to answer the telephone, only to be greeted by a strange female voice asking for another number. A moment later, the telephone rang again. It was the same voice asking for the same number. "Aren't you the lady I told a moment ago you had the wrong number?" asked the housewife. "Next time," growled the wrong number dialer, "don't answer if it's the wrong number." So busy was the astonished housewife trying to figure out how she could tell by the ring whether or not it was a wrong-number call that she lost the golden moment before the receiver went "bang" to set the other party right as to who should have been disturbed. This story has a familiar ring to operators who were frequently chided for ringing a wrong number when the customer called a wrong number in error. There again, customers are human and are reluctant to admit their error.

Right or wrong, let us always remember, our customer is the most important person who comes to our office, via his telephone, or in any other manner. We are dependent upon him for our very existence. He is never an interruption of our work—he is the purpose of it. He is doing us a favor by giving us the opportunity to be of service—we are NOT doing him a favor by serving him. He is not an outsider to our business, he is the mainstay of it. He is not a cold statistic, he is flesh and blood with feelings and emotions like our own. Like ourselves, he has biases and prejudices to be respected. The customer is not someone to argue or match wits with—he is someone to be courteously and dependably served.

Be customer-conscious at all times. The customer is our bread and butter. And, generally speaking, he is a pretty nice person.

Traffic Questions

(1) How is a report given that the called telephone has been temporarily disconnected?

(2) If a telephone has been temporarily disconnected at the subscriber's request, how is this information given to the calling party?

(3) If a party calls a number for which calls are being temporarily referred, what phrase is used in passing this information to the calling party?

(4) If a call is given without a party line designation and the called number is a party line, what should the operator say?

(5) If a call is given with a party line designation and the called number is not a party line, what information is given to the calling party?

Answers are presented on page 54.

ANSONIA® Ankoseal TOLL QUADDED CABLES

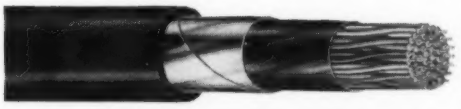
Quality that assures happy subscribers!

ANSONIA® **Ankoseal**

Toll Quadded Cables Assure Best Performance From Your Modern Exchanges

Throughout the country consistent performance reports prove that Ansonia Ankoseal Toll Quadded Cable gives subscribers the finest service available.

You can stop worrying about "Noisy Cable", "Excessive Cross Talk" and "Excessive Circuit Unbalance" when you install Ankoseal Toll Quadded Cable.



Available in 19 Gauge From 7 to 32 Quads

Ansonia Ankoseal Cables
Built Up To Quality . . .
Not Down To Price!

INDEPENDENT

Ask For This New Literature on Ansonia Ankoseal Telephone Cables

1. Telephone Cables
2. Self Supporting Telephone Cables
3. Splicing Booklet

THE ANSONIA WIRE & CABLE COMPANY · ASHTON · R. I.

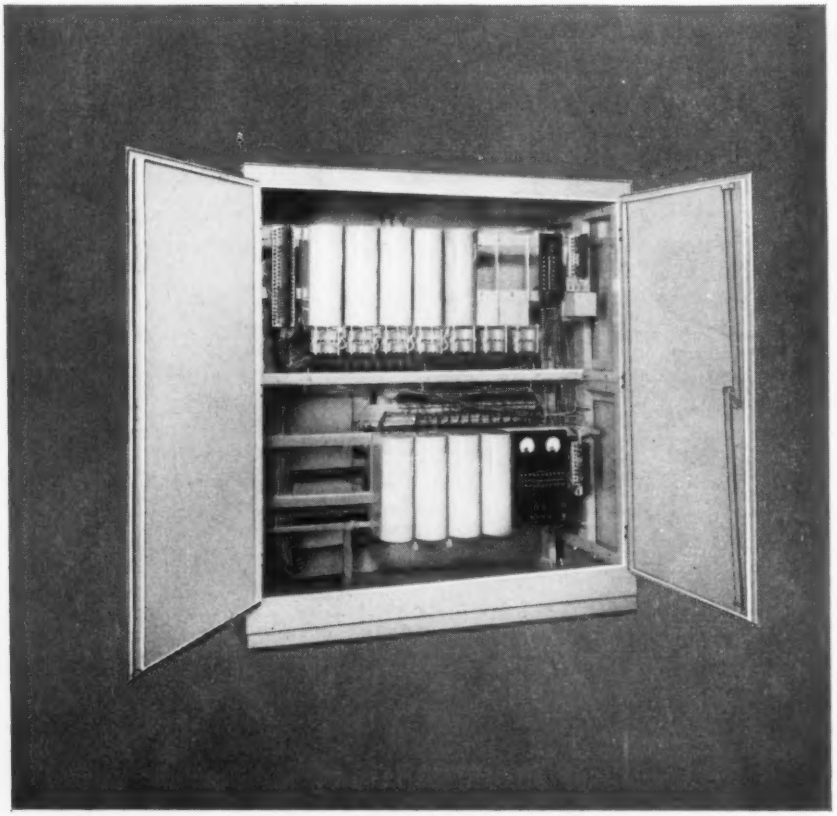
The Oldest Name In Plastic Telephone Cables In The Most Modern Plant Devoted Entirely To Producing Cables.

MISTER...

did you know—
Automatic now
offers you a...

NEW P-A-B-X...

serving up to
50 lines
at a...



XUM

LOW PRICE...

lower, even, than some competitive 40-line boards, and that you get...

FAST DELIVERY!

because it's available from stock? You didn't? Well—read on!

FACTS FOR THE FACTUAL-MINDED

• Automatic's new Type 25B P-A-B-X meets today's most popular service demand—25 to 50 telephones, 7 trunks, 10 links—and can expand beyond 50 stations if necessary. Convenient cordless attendant cabinet.

• Type 25B provides these standard modern services

—Group Hunting (calls automatically routed to an idle telephone in a group)

—"Meet me" Conference Service

• All these optional services, too!

Attendant Priority Service	PA Cut-in
Executive Key-calling	Code Call
Executive Direct-line	Night Transfer
Executive Right-of-way	Call Forwarding
Direct Line Service	Tie Lines
Secretary Answering	"Progressive Selection" Conference Service
Area Paging	"Fixed Group" Conference Service

Your P-A-B-X business future will be even rosier with Automatic's new Type 25B. It's just the size most of your customers need—and it's priced right.

We'll be happy to send you full details. Ask for new Circular 1815-A. Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

A member of the General Telephone System
One of America's great communications systems

GENERAL SYSTEM

XUM

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

THERE IS NO DOUBT that we are going to have communication cables sheathed in aluminum available in the not-too-distant future.

Several startling developments are now under-way that will unquestionably produce a suitable aluminum covering for cable. Just how much of the present lead and plastic-sheathed cable it will replace we would not venture to guess, but from all indications it will do a good job.

It would appear, also, that a clamp-type splice covering can be used to advantage on aluminum-sheathed cable.

•

It is reported that a machine which was recently developed in England can read any typed or printed characters at a rate of 120 a second and feed the information into electronic computers.

Some experimenting has been carried on in the United States with a printed page to perforated tape converter, but it is estimated that the English development is from three to five years ahead of anything we have in this country.

•

The Michigan Bell Telephone Co.'s employes now act as advisers to 17 Junior Achievement companies scattered throughout lower Michigan. These teen-age students of our capitalistic system manufacture and sell a variety of products such as refinished magneto telephones, leather goods, potted plants, plastic picture frames, aluminum clothes poles, and lamps made from old desk stand telephones.

It is stated that Junior Achievement serves two important roles. First, it affords young people an opportunity to learn sound business practices first hand, and second, it helps provide a nucleus of leaders for tomorrow's business world.

We are certain, too, that the sponsorship of these teen agers would not harm the public relations of any telephone company. If any of our readers has any information of an Independent company that acts in a similar advisory capacity to any JA companies, we would be pleased to receive the information.

•

The writer recently spent a very pleasant day in the National Military Park at Gettysburg, Pa. As you know, this is the field of one of the greatest battles ever fought on American soil. The outcome affected the destiny of our nation.

In this battle, 75,000 Confederates were pitted against 97,000 Union troops. General Lee lost 28,000 killed, wounded, and captured, as against a Union loss of 23,000.

When the history of this battle is reviewed, one cannot but wonder how much the outcome would have been changed had adequate communications been available at the time.

•

A recently developed safety light will operate 90 days from an eight-dry cell battery, without servicing. The vertically mounted, cushioned, neon-tube lamp has a large opening in the head to improve flash spread and brilliance.

Over 100 flashes per minute are visible for a distance up to 2 miles. This safety light is available with unidirectional or two-way heads with any combination of red, blue, amber, green, or clear optical plastic lenses.

This device should prove extremely useful as a safety warning light near obstructions in and about the telephone exchange.

•

Down in Texas, the Southwestern Bell Telephone Co. provides the general public with good, strong, moisture-resistant envelopes to protect their hunting and fishing licenses. These envelopes carry small cartoons which indicate the harm that can be done to telephone wires by hunters who shoot birds sitting on the wires and cables.

These cartoons are captioned with such slogans as "Please don't shoot. That bird is on a telephone wire!" It states further that "each year hundreds of telephone lines are broken by hunters who thoughtlessly shoot toward telephone poles, insulators, wires or cables."

Then on the flap of the envelope is the closing statement: "Thank you for not shooting toward telephone wires, insulators or cables." Certainly, this constant reminder to hunters should prevent serious troubles on telephone plant.

•

We often wonder why more use is not made of modern wall coverings for telephone equipment rooms. This includes various types of tile and some of the more recently developed plastics. Painting always proves difficult in equipment rooms and if not properly handled may prove detrimental to delicate and expensive equipment.

With the new wall coverings, painting will not be required and if the wall becomes dingy it may be made new again by simply washing. Added to these advantages, a permanent wall finish will prove economical when compared to painting at intervals of about each three years.

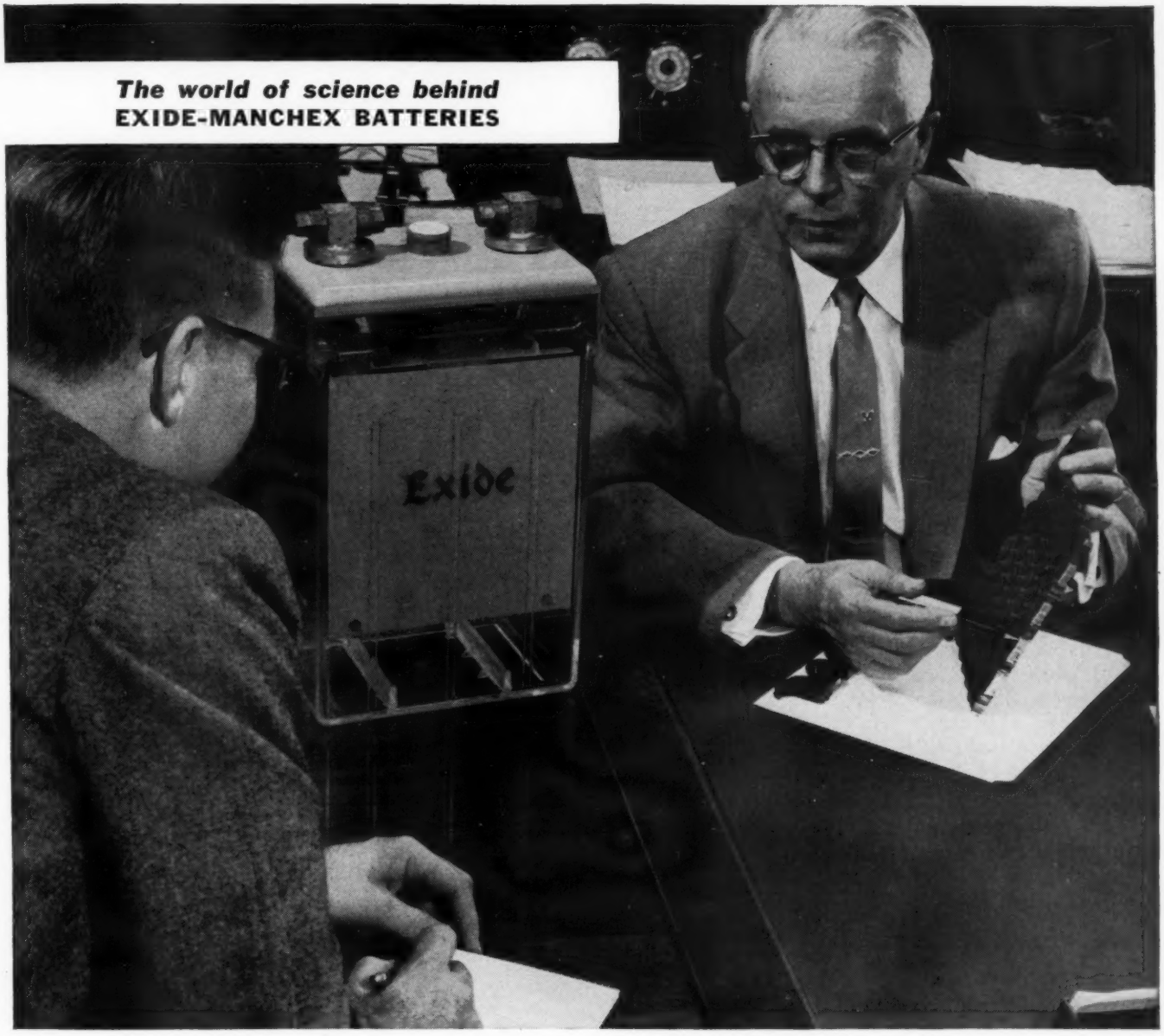
•

We have a clipping from a Dublin, Ireland, newspaper stating that the Greenfield Park Residents Association has been informed by the Department of Posts & Telegraphs that it is not possible to erect a public telephone kiosk at the top of Greenfield Park Estate.

The association was advised that only a limited number of kiosks are

XUM

The world of science behind
EXIDE-MANCHEX BATTERIES

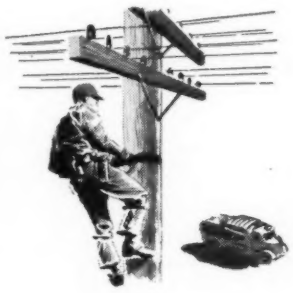


Being interviewed is L. E. Wells, Director of Engineering

"The reserve lead stretches battery life"

At the Exide Laboratories—**Reporter:** You're pointing to the lead buttons in an Exide-Manchex positive plate, aren't you?

Wells: That's right. And only a very small portion of the lead is activated when the battery is made. The rest is left in reserve.



Reporter: Why do you provide this reserve lead?

Wells: To keep the battery young. As long as this reserve is there, an Exide-Manchex Battery works just as well as when it comes from the factory.

Reporter: Is that why the battery lasts so long?

Wells: Yes, and there are Exide-Manchex Batteries in use today over 20 years old with years of life left.

Reporter: Don't other batteries have a reserve lead supply?

Wells: Yes, but the reserve lead must support a plate. When it gets too thin, sometimes the plate disintegrates. The Exide-Manchex buttons are supported by a special grid that doesn't disintegrate. The reserve lead can be completely used without weakening the plate structure.

Reporter: Obviously this is an important feature in the Exide-Manchex Battery.

Wells: Yes it is, but just one of many engineering details that contribute to their long life.

Note to battery users: When you order batteries for float or cycle service in stationary applications, be sure to specify Exide-Manchex. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Co., Philadelphia 2, Pa.

THE ELECTRIC STORAGE BATTERY COMPANY **Exide**®

XUM

being erected this year because of capital restrictions, but that the matter of providing an additional kiosk on the estate will be reviewed next year.

All this seems very odd to us indeed as new housing developments in this country expect a working telephone in each house just as soon as the builder completes his work.

•

The personnel officer of the Signal Office of the United States Army in Europe recently sent the writer a most attractive desk ornament from Heidelburg, Germany.

The ornament consists of a Signal Corps emblem mounted on a very thin chrome base. The crossflags are of chrome and copper and the torch is a small neon light. This light flashes constantly at about two-second intervals.

Being curious as to just what makes the light flash, we removed the base and examined the wiring. The lamp is flashed by a 2-MF condenser that is charged from four 22-volt B-batteries. We don't know who originated this clever ornament, but we are very proud of it and the name plate which states:

RAY BLAIN
FROM USAREUR
1957

•

When Leeds & Northrup Co. of Philadelphia had its telephone number changed recently they sent a postal card to all of their customers apprising them of the fact.

This is an excellent idea and undoubtedly saves considerable time for the customers who would call the old number, MIchigan 4-4900 instead of the new number which is DAvenport 9-4900.

•

It has been reported that a total of nearly 243,000 students enrolled in accredited engineering colleges last fall. This is said to be the greatest engineering enrollment since 1948 when the colleges were filled with war veterans.

Engineering graduates during 1955-56 totalled 23,547, as compared with 20,200, the previous year.

•

A small transistorized pocket receiver, now available for use on a paging system, weighs less than 3 ounces and is smaller than a regular size pack of cigarettes.

The acoustically perfect clip-on miniature lapel-speaker may be worn under the necktie, jacket or blouse.

Plant Man's QUIZ

By RAY BLAIN, Technical Editorial Director

Q. Will the ordinary wooden handle as commonly used in a tree trimmer prove an effective insulator if it should accidentally come in contact with high voltage power wires while being held by a man standing on the ground?

A. That is difficult to state, but we, personally, would not trust accidental contact with high voltages as there could be a dangerous leakage through the wood to ground and which could cause injury to a man.

There is available a laminated phenolic-insulated pole for tree trimmers that weighs only about one-third as much as wooden poles. The manufacturer claims that one-eighth of an inch of this laminated phenolic insulator pole insulates against 56,000 volts. Furthermore, that 4-foot lengths available, under proper conditions, should prove safe against 269,000 volts.

Q. We have found it necessary to install a main frame in an existing building and are faced with the problem of installing sleeves for cables running from the basement cable vault to the verticals on the frame. Can you furnish any information as to how this can best be accomplished?

A. We suggest the use of one of the hollow drills now on the market. These drills will cut clean, smooth holes in the concrete.

To make certain that holes are spaced and aligned properly, it is a good idea to drill holes in a plank first. When you are certain that the holes are correct, place the plank firmly in place on the floor for use in starting the drill.

This will not only make sure that the holes are located accurately, but it will also prove a time-saver.

•

Q. We have a PBX subscriber who complains because his customers make unauthorized extra-unit calls since direct distance dialing has been placed in operation in our area. Will it be possible to restrict all trunk calls out of the PBX to the one unit zone only?

A. Diversion equipment has been developed and successfuly employed for this purpose. This equipment is associated with the trunks at the PBX. When a subscriber dials a number in other than a one-unit zone, the call is diverted and the trunk released.

This diversion may be to an operator, a busy tone, a no-such number tone, or a recorded announcement.

•

Q. We are contemplating the purchase of a new tone-type cable tester for use on our system and would like to know what features, in your opinion, we should consider in the selection of this tester.

A. We believe that you should consider carefully the features of all testers of this type now on the market and then select the one that, in your opinion, will do the best job for you. Actually, all of the testers on the market today are very good.

A cable tester could be made that would generate a tone loud enough to be heard a foot from the cable. Such a unit would be worthless, however, as it would carry over the fault and not locate it.

All that is necessary is a clear, audible tone and one that will not carry over even a high resistance fault.

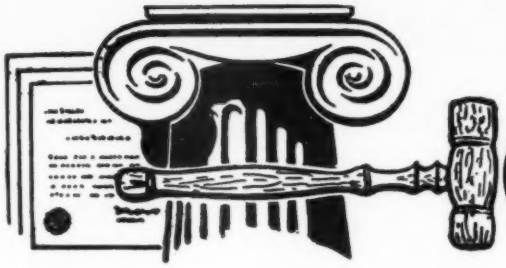
An important feature of one cable tester now available is its low frequency, 20 cycle tone, which is not so low as to be below the limit of audibility, yet is still sufficiently below the normal 60 cycle hums which are usually present.

Its tone is thus not easily confused with foreign hums which may also be audible to the lineman using the tester.

Personally, we prefer to use an amplifier on any tester to better identify the tone and note the change at the fault when a low volume is used.

A volume control on the amplifier permits setting the tone at any level desired. This proves especially desirable and helps one materially to hear a weak signal on windy days.

XUM



Courts and Commissions

Nebraska Commission Denies Toll Rate Pleas

The Nebraska Railway Commission on May 10 denied the application of the Union Telephone Co., Blair, to apply and collect Nebraska intrastate message toll rates as approved for the Northwestern Bell Telephone Co.

Toll lines involved are jointly owned by the Union company and the Northern Telephone Co., Blair. The application stated that it would help establish uniform toll rates for comparable airline mileage.

The commission stated that the applicant company had failed to establish, in the manner prescribed by law, that the proposal was in the public interest.

Applications on the same proposal by the Eastern Telephone Co., Blair, and the Northern Telephone Co., were also denied.

Court Issues Injunction In Use of Code to Dodge Tolls

New Jersey Superior Court Judge C. Thomas Schettino issued on May 24 a temporary injunction restraining the Kilmer Transportation Co. from permitting its traveling drivers to use a toll-escaping telephone code system to stay in touch with their home office.

The injunction was issued pending a hearing on June 7 on New Jersey Bell Telephone Co.'s suit to make the trucking company stop using the allegedly abusive and fraudulent code system.

The telephone company charged the trucking company has defrauded it of more than $3,600 at the rate of about $100 a month, by having drivers on the road call themselves person-to-person to give the company's dispatchers their location and other information.

The complaint included photostatic copy of what was said to be the trucking company's instructions to drivers, ordering them to call the dispatcher twice daily and whenever unloaded. The instructions in photostat read:

"We will tell the operator where you are going or where you are to go for your next load, or to call back (and we mean it) or that we don't expect you for a few days because we don't know where your load is destined for. You should ask the operator if the party you are calling might be reached at—(blank) so that we will know where you are going."

The instructions remind the drivers to make the calls between 9 a.m. and 5 p.m. and to be sure to, "make allowances for the time zone."

The suit charged the code system "includes false representations by drivers and by the defendants' dispatchers to long-distance operators, so that operators are tricked and deceived and thereby caused to relay code messages relating to the driver's identity, location, whether the truck is loaded, his destination, instructions to driver and other information pertinent to the defendant's business activities."

Also named as defendants are the company's president, Abraham P. Fisch, and a former dispatcher, Henry Saidenberg.

Loan Authorized for Nebraska Independent

The Central Nebraska Telephone Co., Blair, was authorized by the Nebraska Railway Commission on May 24 to borrow up to $275,000 from Stromberg-Carlson (TELEPHONY, May 18, p. 38).

This will be used to retire temporary borrowings and to convert five exchanges serving 2,120 stations to dial service. These exchanges are Grant, Sutherland, Imperial, Palisade and Hayes Center. The Venango exchange serving 157 stations is now automatic. In addition, the company provides switching service to 667 subscribers.

Interim notes will be issued as the work progresses. One final note not to exceed $275,000 will be issued, payable in 240 consecutive monthly payments.

The commission also gave approval for the discontinuance of all toll lines owned by the company. These lines will be used to reduce the number of subscribers per line on rural lines. Long distance service is presently provided by the Northwestern Bell Telephone Co.

Ill. Company Asks Raise

The Illinois Commerce Commission on June 5 was to hear the petition of the Galva Telephone Co. to increase rates.

Concord (N. C.) Company Requests Rate Relief

The Concord Telephone Co. on May 28 told the North Carolina Utilities Commission that increasing costs, including expansion and wage increases, had made it necessary that it be granted permission to increase its rates.

It said that as of May 31, 1956, the company's costs per station were about $200 a year, and it has 3,241 stations. Since last Jan. 1, the number of stations has increased by 758 and costs have increased to about $215 per station, it said.

Gross plant and equipment valuation was listed at $6,529,000. Officials said recent purchases of new equipment are increasing costs and that wage increases of $72,956 have been granted to company employes and officials.

Minnesota Commission OKs Sale of Seven Companies

The Minnesota Railroad & Warehouse Commission on May 24 authorized the West Central Telephone Association of Wadena to purchase the following properties: High Prairie Telephone Co.; Verndale Bartlett Telephone Co.; Wing River Telephone Co.; Partridge River Rural Telephone Association; Hay Creek Telephone Association.

The West Central Telephone Association also was authorized to purchase certain properties serving 14 stations from Central Telephone Co. These facilities are located in Wadena County.

On May 23 the Hackensack Telephone Co. received authority to purchase the entire properties of the Arvig Telephone Co. of Pequot Lakes.

General of Upstate New York Places Bonds and Stock

General Telephone Co. of Upstate New York, Inc., on May 28 sold at par $800,000 principal amount of first mortgage bonds, 4¾ per cent series due

(Please turn to page 42)

XUM

the man who puts himself i

in your shoes

Your Automatic Electric Supply Warehouse Manager takes a personal interest in your problems.

Like seeing to prompt delivery of emergency materials. Or working 'way past the "quitting bell" to get a job out. Or passing on a helpful tip he's learned during his day-to-day contact with other telephone men.

He's done it all—time and time again. And it's little "extras" like this that cause so many telephone companies to use Automatic's Supply Service.

You'll find your Automatic Electric Supply Warehouse Manager listed below. Call or write him today. He'll be tickled pink to help you!

AUTOMATIC'S 5 WAREHOUSES:

Chicago 7, Ill.
George Ferguson
1033 W. Van Buren St.
HAymarket 1-4300

Portland 10, Ore.
Ed J. Chok
2360 NW Quimby St.
CApital 3-7244

Kansas City 8, Mo.
Gene Martin
2021 Main St.
HArrison 1-4720

Richmond 21, Va.
"Mitchie" Hester
2915 Moore St.
Tel. 6-9280

Johnson City, N. Y.
Fran Batcher
158 Corlis Ave.
Binghampton 7-8507

Automatic carries a complete line of quality supplies.
You get what you want when you want it.

AUTOMATIC ELECTRIC

A member of the General Telephone System
One of America's great communications systems

GENERAL SYSTEM

XUM

1987. The bonds were placed privately with one institutional investor.

At the same time General Telephone Co. of Upstate New York, Inc., sold 14,000 shares of its common stock to General Telephone Corp. for $700,000.

The funds secured by General of Upstate New York will be used to retire short-term bank loans and for 1957 construction and expansion purposes.

Texas Company Purchases Another Independent

Negotiations were completed recently in Texas by the Rocksprings & Nueces Canyon Telephone Co. for the purchase of the Utopia Telephone Co. from its owners, Mr. and Mrs. Henry Burns. The transaction was retroactive to May 1, according to Carson Gilmer, manager for the Rocksprings and Nueces Canyon company.

The Utopia company includes 203 subscribers serviced by 151 miles of pole line.

Study Advises Surtax Cut With 50% Rate Ceiling

New evidence that "one of the important reforms needed in the individual income tax is a reduction of the highest marginal rates" was disclosed on May 13 in a 40-page study by Tax Foundation, Inc., New York 20, N. Y.

The steeply progressive rates which permit the government to take as much as 87 cents of every dollar of a person's income can be defended "neither on revenue grounds nor on equity grounds, much less on grounds of their effects on the economy," the study concludes.

Roswell Magill, Foundation president, called for a rate ceiling of not more than 50 per cent in a note to the study entitled, "Are High Surtax Rates Worthwhile?" The study shows that a 50 per cent ceiling would still permit the government to receive about 98 per cent of its current revenue from the income tax.

"If we want to preserve the process of individual saving and risking for profit, which has given the biggest single impetus to our fabulous economic history, we must begin at once to prune high surtax rates," said Mr. Magill, former Undersecretary of the Treasury.

"From a revenue standpoint, they diminish receipts instead of expanding them, they distort economic activity by influencing incentives and business motives, and they handicap economic growth. They lead to practices that are wasteful and destructive."

Although the apparent revenue loss from a 50 per cent limit would be about 700 million dollars, the study shows this amount probably would be less in actual practice.

"Except in periods of recession, cuts in top marginal rates historically have been followed by substantial increases in the income subject to these rates. Moreover, the entire economy will benefit from lower top rates. Pools of new capital would become available for new enterprises," said Mr. Magill.

The Foundation, a private research organization, found in its study of surtaxes between 1916 and 1953, that when tax rates were raised, income reported in the highest income class either declined or increased relatively little, and when taxes were reduced, there was a sharp rise in upper bracket returns.

The study discusses several explanations for the fluctuations—tax evasion, tax avoidance through loopholes in the law (increased investment in tax exempt securities, bunching of capital gains or losses, substitution of fringe benefits for salaries and wages, creation of trusts) and failure to produce or earn income.

The Foundation concludes that other avenues of escape are overshadowed by the severe limitation placed on the growth of dividends by high individual and high corporation income tax rates. Proof that the high taxes encourage greater retention of corporate profits and a limiting of dividends is drawn from the fact that dividends were only 26 per cent of corporate profits before tax in 1955, compared with 60 per cent in 1929.

Commenting upon proposals to use high surtaxes to "redistribute" income, the study points out that the "great scissors of inflation and taxes" has been "more effective in reducing real disposable income above the middle income levels than the advocates of such proposals could have foreseen."

While factors other than taxes enter into the overall picture, the survey concedes, the "remarkable change" in the distribution of income over a 30-year period "would seem to have removed much of whatever grounds may have been held for redistribution of income through the tax structure" and it adds:

"Insofar as rates running up to more than 90 per cent are designed to put a limit on high incomes, that purpose has clearly been more than accomplished."

The Foundation says however, that since this change in the distribution of income can only partially be attributed to higher taxes, "a reduction of the top bracket rates from their present almost confiscatory levels" could hardly lead to a "dangerous" concentration of income in the high income classes.

The study also points out some effects of high taxes on incentives to work and invest. For one thing, the "mobility" of executives is reduced by substitution of other forms of compensation which often tend to tie individuals to one company. Capital funds are channeled into investments which receive favorable tax treatment.

"The higher the rates of taxation the greater is the incentive to shift expenditures for non-deductible to deductible items, to convert income into non-taxable forms, to switch from investments for the sake of ordinary income to those which yield large capital gains or those which get special tax treatment, to lessen productive effort or to accept less efficient management of resources, and the more reluctant are investors in the aggregate to make equity-type investments," the study indicates.

The study sums up the case for a reduction of the top surtax rates with the following reasons:

(1) High surtaxes provide little revenue, and the history of rate changes suggests that a reduction now is more likely to increase revenue than reduce it.

(2) They result in substantial inequities because different forms of income (fringe benefits, capital gains, deferred incomes, unstable income, income from many years' efforts received in one year) are, in effect, taxed at widely different rates; and they encourage efforts to obtain income in non-taxable form or in forms subject to lower rates.

(3) They have, in combination with inflation, produced an absolute fall in real income for the highest income groups which has probably exceeded the demands of the "levellers" of past decades, and which goes beyond any justification on the basis of "ability to pay."

(4) They have serious distorting effects on economic activity—on the incentives of individuals to move to new positions, on the flow of financial funds, and on the direction of capital investment.

(5) In the long-run, they have probably had adverse effects on the growth of the economy through their impact on savings and investment capacity in high bracket incomes, although the statistical evidence in this area has been obscured by the effects of inflation.

The Foundation, a non-profit organization, is engaged in research on government spending and taxation. Its purpose is to aid in the development of more efficient government at less cost to the taxpayer. It also serves as national information agency for organized taxpayer research groups throughout the country.

XUM

Greatest advance in microfilming–

Kodamatic Indexing!

New Recordak Reliant Microfilmer with Kodamatic Indexing lets you code items photographically right on the film—find any picture faster in your film reader.

So easy—just dial the desired code number on the new Recordak Reliant before you feed a batch of documents.

This simple step takes the hunt and peck out of subsequent film reference. With this completely new type of indexing your code designations are never out of sight . . . can be read easily, no matter how fast your film is traveling.

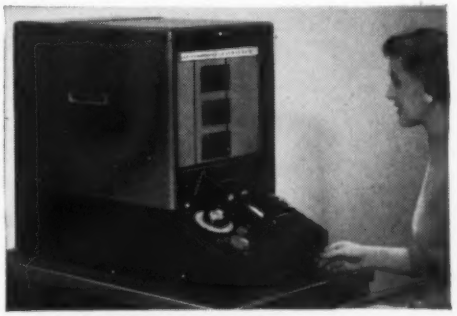
The secret: Unique coding lines are *photographed right on the film* between documents. These lines, which appear to run continuously when film is advanced, are read against a scale on the top (or side) of your film reader.

The girl on right, for example, has stopped film at items indexed "43." Line at left is at 40 . . . other line at 3.) Up to 100 different codings can be made and found in a flash!

Saves time every time films are viewed

Ever so much easier for you to find toll tickets and customer statements. Or to check back on tax reports and other office records. No end to the uses—wherever records are filmed and referred to, you'll be dollars ahead with Kodamatic Indexing. (Just one of the exclusive features found in the *new* Reliant!)

But see for yourself! Have a new Recordak Reliant Microfilmer with *Kodamatic Indexing* installed on a 30-day Free Trial Basis. Absolutely no obligation to buy or rent. But act today—requests filled in order received.



"Recordak" is a trademark

MAIL COUPON TODAY

RECORDAK CORPORATION
415 Madison Avenue, New York 17, N. Y. CC-6

Gentlemen: We are interested in free 30-day trial of new Recordak Reliant Microfilmer with Kodamatic Indexing.

Name_____ Position_____

Company_____

Street_____

City_____ State_____

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

RECORDAK
(*Subsidiary of Eastman Kodak Company*)
originator of modern microfilming—
now in its 30th year

XUM

LOCATING OPENS IN DISTRIBUTION WIRE

Concluded from page 21

good ground is readily available at the distant end of the pair under test.

Parallel or twisted pair drop wire opens can be located by the same methods as described for parallel line wire.

Fig. 5 shows an exploring probe arranged for mounting on a jointed rod, which can be used for running down opens in rural or urban distribution wire and also parallel line wire.

The base of the exploring probe is made of plastic or hard wood such as maple, etc. The flared portion of the one illustrated in *Fig. 5* is made of Plexiglass which can be bent into the desired shape by heating. Other nonmetallic material also may be used.

Microphone connectors are used to connect the length of one conductor microphone cord to the probe and also to the amplifier. The dotted line of cross-section *Fig. 5* shows how the pick-up wire is brought up close to the surface of the body of the probe. At this point a wire is placed crosswise the entire width so that any wire under test being passed through the exploring probe must come close to the sensitive element of the probe.

Other Uses

The amplifier shown in *Fig. 1* can also be used to great advantage for pair identification in any cable textile, paper lead or plastic.

The same tone (Bug) described above can be used together with the amplifier and probe to identify individual pairs in any size cable without in any way disturbing the insulation. It is a real labor saving device.

When locating shorts, crosses, grounds or split pairs in metallic sheath cables by the tone and exploring coil method, the tone picked up by the coil can be amplified by use of the amplifier shown in *Fig. 1*. This application is especially useful in noisy locations or when locating shorts deep inside of a large cable.

The amplifier is also useful in the central office for locating faults in equipment. By using it with the probe as a signal tracer, a simple tone will supply the signal.

The circuit of the transistor amplifier is shown in *Fig. 3*. (Disregard the note to ground clip because no actual ground connection is required. The shield of the microphone cord must be connected to the metal box and wiring as shown.) Following is a list of parts required to assemble the amplifier, all which are relatively inexpensive:

Transformers

T1 First audio Thordarson Part No. TR-26.
T2 Second audio Thordarson Part No. TR-14.

Condensers

C1 1500 MMFD Ceramic
C2 2 MFD—6-volt Sprague or equivalent.
C3 2 MFD—6-volt Sprague or equivalent.

Resistors

R1 100,000 ½ watt carbon (brown, black, yellow).
R2 150,000 ¼ watt carbon (brown, green, yellow).
R3 270,000 ¼ watt carbon (red, purple, yellow).

Transistors

VI CK721 Raytheon or equivalent.
V2 CK721 Raytheon or equivalent.

Volume Control

VC1 ½ Meg with switch — Centralab No. B16-218.

Miscellaneous

B1 2 Burgess No. 2 Penlite cells or equivalent.
1 Battery holder—BH60 Philmore.
1 Double headset telephones—1,000 Philmore Brandes or equivalent.
1 Probe (two-conductor modified switchboard plug).
J1 Telephone plug and jack—Telex No. 9240 or equivalent. 5 feet of single conductor shielded microphone cord.

DEMAND INCREASING FOR SPECIAL USES

Continued from page 24

blue prints, sketches or any other pictorial material can be sent by wire.

(2) Telephotograph by which recently-taken photographs can be sent by wire.

(3) Closed circuit television.

(4) Teletypesetter. This service permits an operator in one town to activate and operate a linotype machine in another town.

(5) Remote metering and supervisor control to secure station conditons; to connect and disconnect equipment such as pumps, valves, private radio transmitters, and receivers; to start and stop motors; to transmit alarms; to remotely measure the level of liquid in a gasoline storage tank.

We recently received a request for a facility that will do more than one thing (designated as alternate use service) such as using a voice channel for voice intelligence and also for supervisory control purposes, or for voice and teletypewriter, facsimile, remote metering.

More and more requests are being received in connection with integrated data processing. In this field, channels of teletypewriter quality are being used to the greatest extent. But the development of high speed transmission equipment currently under way by business machine manufacturers has resulted in requirements for higher quality channels and telephone quality is beginning to be used for this purpose and may be required for the majority of such systems. Future developments may require channels of better than telephone quality. We may be asked to provide program or radio quality or even video, or television, quality for some of them.

The Bell Laboratories have recently developed the "Data Subset." This device is still in the experimental stage and is designed to give accurate transmission of data produced by a wide variety of information processing machines, such as electronic computers, electric typewriters, or adding machines. The device will permit printed material to be sent over lines of telephone quality at a speed of about 1,000 words a minute. Voice communication can precede or follow the operation. The equipment uses a magnetic tape rather than a punched paper tape and could be set up to operate in off-peak telephone traffic hours. For example, the subset could transmit over one line from 5 o'clock in the evening till 9 o'clock the following morning, giving an output equivalent to that of some 30 expert typists typing at full speed for eight hours.

So much for the expanding requirements for special uses of our telephone facilities. But let's again list some of our major customers who will require increased special uses of our facilities:

(1) Business concerns with out-of-town branches, or with plants located in cities away from the "home office." And, let's remember that when the customer decided to decentralize, he probably didn't take the trouble to find out if the locations of his new branches are in Independent or Bell territories, and it must make no difference.

(2) Intercity transportation companies — bus lines, railroads, airlines, trucking concerns — to interconnect their various stations, depots, and other installations.

(3) Pipe lines and power companies for communication between their far-flung offices and stations.

(4) The federal government — particularly since it, too, participates in this office decentralization movement which we have talked about. Requirements for air defense, particularly in connection with SAGE projects, are substantial.

(5) The private line network of the Civil Aeronautic Administration covers the whole continental United States and is vital to the coordination of civilian plane flights from take-off to landing. Over 100,000 miles of telephone circuits are used in this network and considerable increases are planned for the coming years.

(6) Local businesses for intra-exchange channels, for burglar alarms, private lines, or metering.

(Please turn to page 48)

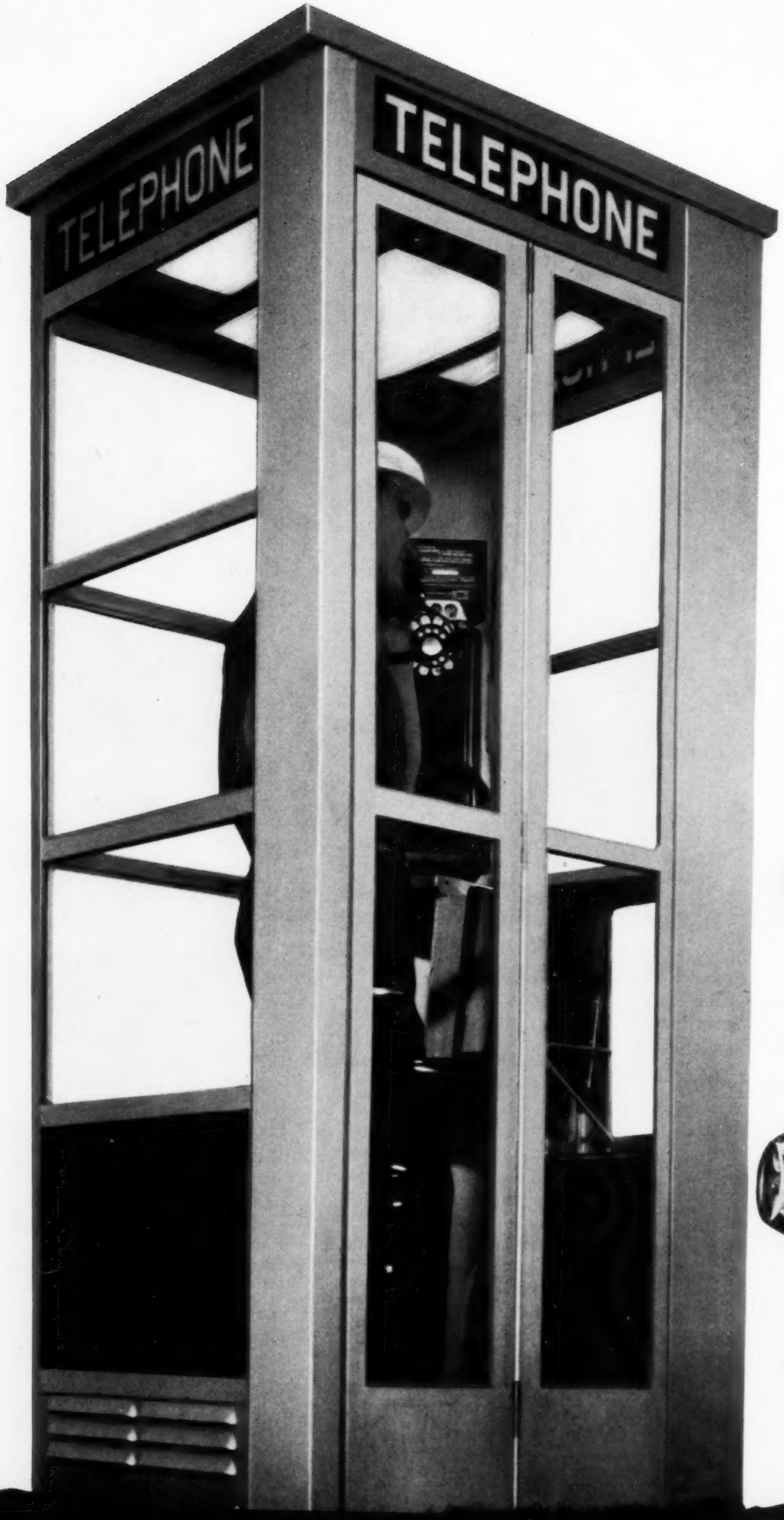
Now you can gain *all* the advantages of combining cashiering and recordkeeping functions in one location, with the new specially designed REMINGTON RAND® Customer Service Counter. One sectional counter unit accommodates all facilities and records for these operations... for the larger office several units can be joined together in perfect harmony.

Designed to eliminate "standing" cashiering, the counter height permits the clerk to serve from a seated position facing the customer. Facilities for a normal cashiering operation are within arm's reach. As a result customers are served more cordially, promptly and efficiently.

Most important, full time point-of-use fire protection for your vital records is now available in desk-height, certified, insulated counter units. For an estimate on a Customer Service Counter installation tailored to your specific requirements, contact your local Remington Rand representative. For FREE descriptive folder SC764 write today to Room 1661, 315 Fourth Ave., New York 10.

Note the compact, efficient and comfortable working area side of the Customer Service Counters, pictured in the above typical Telephone Company installation. Three units combine protection and convenience for operating records and cash.

Remington Rand
DIVISION OF SPERRY RAND CORPORATION


TELEPHONE
TELEPHONE

Here's a paying guest

Almost every telephone company will have guests from out of town this summer—vacationers either passing through or stopping over awhile.

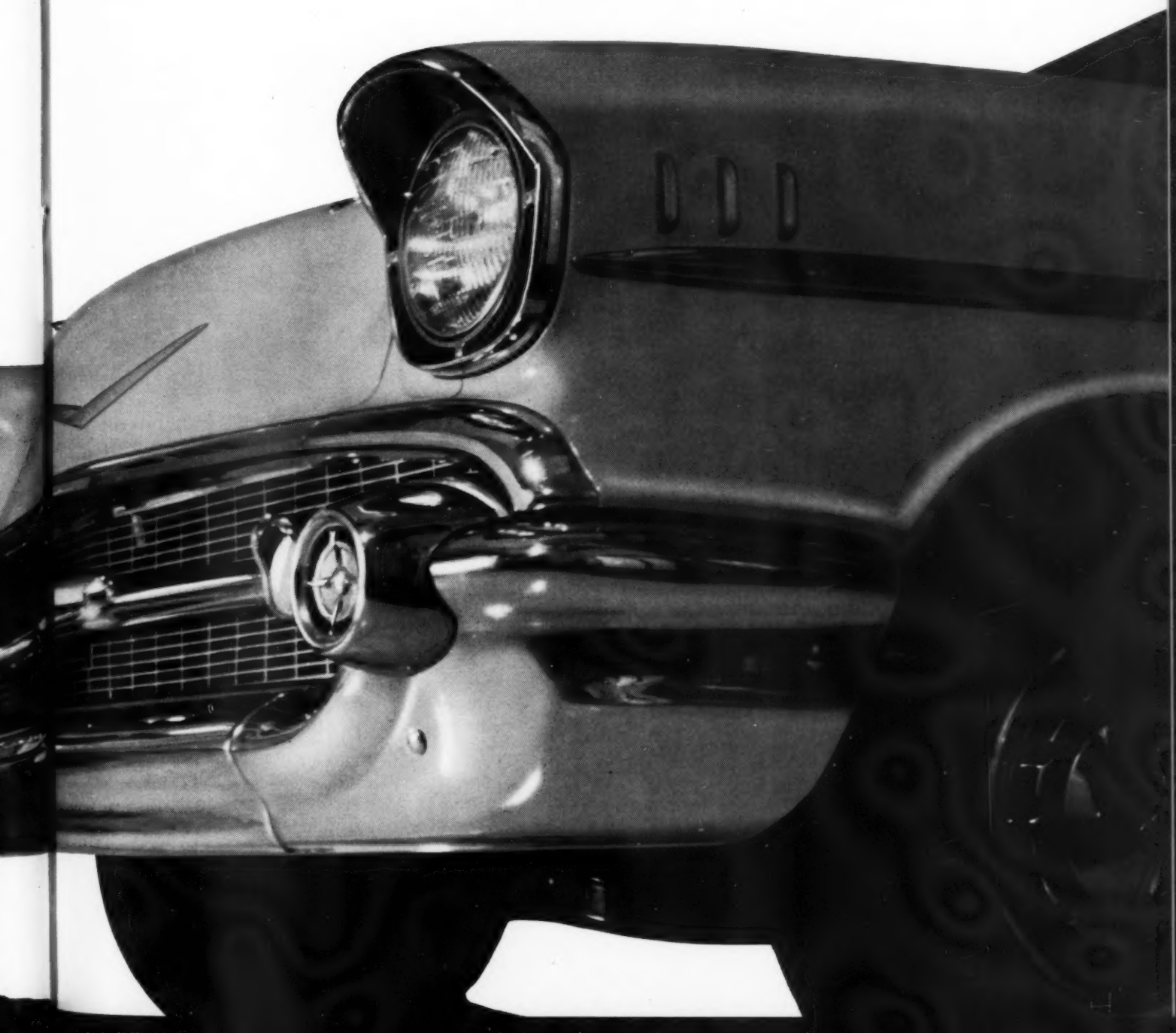
A special series of magazine advertisements is reminding Mr. and Mrs. Traveler of the many ways the telephone can help them have a more enjoyable vacation: by helping them to secure accommodations where they're going, say "hello" to friends and relatives along the way, keep in touch with home or office.

Mr. and Mrs. are reminded also of the *low* long distance rates—so low that it makes *sense* to use the telephone.

Because such advertising stimulates local and long distance usage in every part of the country, it will help increase revenue for all of America's telephone companies.

Working together to bring people together

BELL TELEPHONE SYSTEM



Now, I think we should consider what we are going to do about providing these special services we have been discussing.

First, what does the future look like? That is always a difficult question, but when we consider the many new types of special uses of telephone facilities being developed and introduced, it is possible that the rate of growth in the future will be even more rapid than it has been in the past. It is conceivable that the requirement for special uses could more than double again in the next five years. The introduction of the Data Subset alone could do this.

We are going to be in a new business. If we have thought that we were in the switchboard telephone business only, we should re-examine our position. What will this future mean to us in terms of providing additional facilities? What about the new money that will be required and where can we get it? What about the people or machines that we will need—where will we get them and what will they cost us?

This may sound pretty elemental, but I think that we should first decide whether or not we want this new business.

What is our business? We will all say that communications is our business. But does our concept of communciations meet this rapidly growing field? If we agree that communications is not limited to providing a telephone that can be connected to any other telephone, then providing special use facilities is our business and we can begin to look at what must be done if we are to get our share. Without combined efforts of each and every telephone company in the United States, the facilities cannot be provided which will enable the telephone industry to secure its full share of this new business. However, with cooperative effort of all telephone companies, our industry can maintain its long-recognized position of leadership in the communications field.

We have talked about the nationwide telephone system which permits one telephone subscriber to talk with another, totally unaware of the multi-company nature of the service he is using. We must apply this philosophy in rendering special services. The different telephone companies must provide these services in a way that the customers do not experience any difference in the quality of service handled jointly by the various companies.

To accomplish this, every company must have the same attitute toward these special services as we have toward the conventional interchanged toll service. We must recognize that we all have a joint responsibility in providing these special services in regard to their—

(1) Availability
(2) Reliability
(3) Economy

To make the required facilities available might not be too easy today, but it is not too late to start considering them in our forecasting. We never know who will need the special services tomorrow and the closer we are to our customers the better chance we have to develop with them their future requirements for the services. Our sales people are working closely with all of our forecasting teams in an effort to improve the availability of facilities for special services.

Another point to consider in making the special services available is our tariffs. If we have facilities available, do we have tariffs to cover them?

When we understand how important these services are to the customer we realize the premium he places on reliability.

This falls primarily in the plant department field, but it is important to all levels and all departments. I believe that a better understanding by all employes of the functions, importance and obligations we assume in providing special services will do much to help us eliminate out-of-service time and troubles. This involves certain employe responsibilities, namely: High quality installation and maintenance; avoidance of trouble through special safe-guarding measures, and speedy restoration of service when troubles occur. These require teamwork between Independent and Bell plant groups, the Long Lines Department of AT&T and the customer.

And, these special services must be priced right—right for us and right for the customer. We might ask, "Are we reflecting the improvements in the telephone art in our rates?" The communications manufacturers are doing this when they sell equipment to the ROW customer. And, when you look at the line-up of manufacturers, trade organizations and individuals requesting to be heard before the FCC in the pending microwave hearings, you realize that it is possible that many more of our customers may be permitted to furnish their own intercity communications systems.

Availability, reliability, and proper pricing—these are all subjects within themselves and if you are interested, I am sure Bell Company Independent relations people can make available to you information about the work being done by Bell companies in all three fields.

I have tried to outline a problem which I think is facing us. I have tried to develop the magnitude of the problem—the way it is effecting and will effect the telephone industry.

If I have said anything which will lead telephone companies to recognize their joint responsibility in this field, that will make them aware of the fact that special uses of our facilities may soon become the major uses, and that will suggest what we *must* do if we are to be the leaders in the business of communications—then, the time we have spent discussing the subject will have been well spent.

IN THE NATION'S CAPITAL

Concluded from page 19

would ever get out of their contribution for cheap electric rates for this area. As the late Col. Bertie McCormick used to say, editorially, in his Chicago *Tribune*, "There's a river in this country that flows through eight states, but drains all 48—the Tennessee." Maybe the real question is not so much what the TVA named for the taxpayer; but what kind of a name some taxpayers call the TVA.

Obituary

MAURICE J. MCCARTHY JR., 50, commercial vice president of Anaconda Wire & Cable Co., died on May 24 after a short illness.

Mr. McCarthy started with Anaconda Wire & Cable in 1930. He held various positions in the company's sales organization in Cleveland, Cincinnati and Muskegon and was appointed vice president in 1954. He was recognized by the industry as one of the leading figures in the magnet wire field. At the time of his death he had his office at the company's Muskegon Mill.

Mr. McCarthy was a noted amateur golfer. As a student at Georgetown University, from which he received a B.S. degree in 1930, he won the National Intercollegiate championship. He competed in many amateur golf tournaments and in 1932 was a member of the Walker Cup team which defeated Britain's best amateurs, 8 matches to 1.

Indiana Pioneers Elect

The J. K. Johnston Chapter of the Independent Telephone Pioneer Association at its annual meeting at the recent Indiana Telephone Association convention elected the following chapter officers: President, G. A. Richwine of Connersville, southern division manager of General Telephone Co. of Indiana, Inc.; vice president, LaMar S. Stoops, vice president of Nappanee Telephone Co., and secretary-treasurer, E. L. Malone of Logansport, General Telephone Co. of Indiana, Inc.

New HOMELITE Pump

Whispers While It Works

Goodby residential complaints! Here's a new lightweight gasoline engine driven pump that takes it easy on the neighbors' ears. Yet handles any water problem . . . from seepage to volumn pumping! The new Homelite Model 36 S2 2″ self priming centrifugal Pump operates at slow speed with low noise level yet has high capacity of 9000 gallons per hour. It weighs only 85 pounds and can be easily carried by one man to the best pumping location. Starts quickly, primes automatically, gives long, dependable and trouble-free service under the toughest conditions. Ask your Homelite Representative for a free demonstration. You'll find a good neighbor policy in every pump.

HOMELITE

A DIVISION OF TEXTRON, INC.

1806 RIVERDALE AVENUE • PORT CHESTER, N. Y.

construction and maintenance DIGEST

- **More protection than ever**
- **Insure your power**
- **Nix on cross-ring**
- **Anti-aging cable**

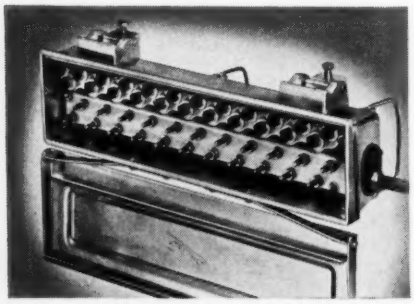
Published regularly to help you get the most out of your materials and supplies dollar

by Philip W. Blood, Office Mgr. and Inside Sales—Pacific Coast

In my 14 years with Stromberg-Carlson I've come to know the careful attention paid to supply orders like yours. When you order equipment from Stromberg-Carlson, **everybody** makes sure it's right. First, the manufacturer. He produces a long-lived product and his good name comes with it. And then Stromberg-Carlson—in delivering the product to you—gives you a guarantee backed by our 62-year reputation. So you get your money's worth for day-to-day operations—and you invest something in the future, because it's your supply business that plays a major part in helping us continue our research for new and better telephone equipment. It's business we certainly appreciate—thanks a million for your continued support!

Terminal with New Protector

Now get more dependable protection than ever for station or cable—with Reliable Electric Company's strand mounted terminals.



Precision manufactured terminals of highest quality

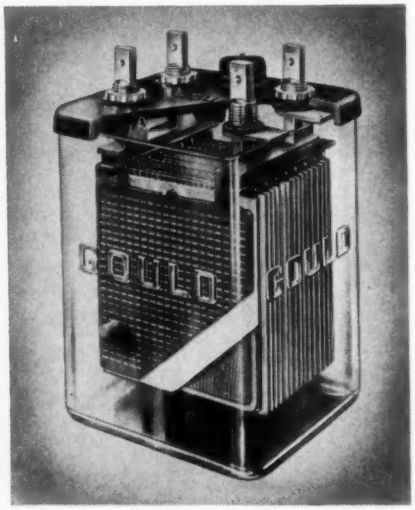
These terminals are equipped with the new Reliable Fuseless Protector Unit, which dissipates static discharges across elements to ground.

Another important feature is that the silicon bronze binding posts on which cable stubs are terminated are sealed with the wires in a glass-reinforced polyester resin of exceptionally high dielectric qualities.

Surface leakage is minimized or completely eliminated by 1-1/16" spacing of binding posts.

Insure your power supply

Because Planté batteries practically last forever... providing standby power that never fails... they're the best operating insurance you can buy. In switchgear, signal and alarm systems, or emergency light and power applications, these lead batteries have rolled up amazing performance records . . . are famous for their ability to deliver a powerful surge or a steady flow of current the instant it's needed. Make sure you're in operation . . . always. Choose Gould Planté.

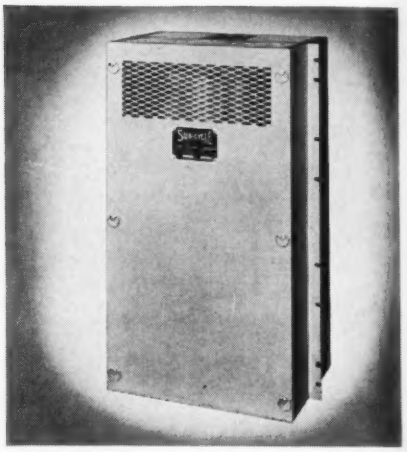


A sure, dependable supply of power when you need it. That, briefly, is the story of this Gould Planté battery.

Your Stromberg-Carlson representative can offer prompt delivery on your order.

How to prevent cross-ring in decimonic systems

One good way to avoid cross-ring is to lock your ringing frequencies securely to the 60-cycle supply frequency. This eliminates frequency drift.



K-5 Sub-Cycle is available for 19" rack, as shown, or in other dimensions to fit 23" rack.

You can do this with the Lorain K-5 Sub-Cycle converter for decimonic ringing systems. This machine provides frequencies of 20, 30, 40, 50 and 60 cycles. These frequencies are rigidly locked into a fixed ratio with your 60-cycle input, by the following methods:

For 60-cycle ringing, a voltage regulator works directly off the input line. For 20 and 30 cycles, self-starting frequency dividers work directly on the input line. For 40 cycles, a frequency doubler is energized by the 20-cycle generator. For 50 cycles, a modulator combines the 20- and 30-cycle frequencies.

Accurate frequency control is just one of several advantages you get. The Lorain K-5 Sub-Cycle has no moving parts, no expendable components—your maintenance costs are nil, once it is installed. Another cost-saving benefit is its very low power requirement.

Ask your Stromberg-Carlson representative about the Lorain K-5 Sub-Cycle.

XUM

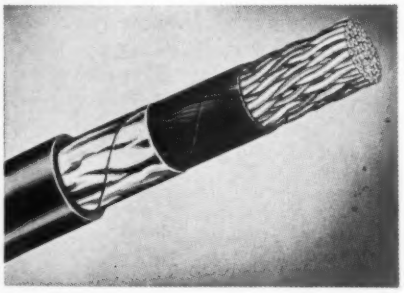
Cable has polyethylene sheath for extra-long life

In outside cable installations, you can side-step the ravages of weather, sunlight and temperature, saving yourself many dollars and hours in maintenance.

To do this, use the protection of the polyethylene sheath on Whitney Blake Telecable®. Telecable exchange area cable for aerial and duct use has polyethylene insulation and polyethylene sheath. No other thermoplastic material has given as good assurance of aerial cable sheath life expectancy as has polyethylene.

Specially treated to resist sunlight, the Telecable sheath has maximum chemical resistance, is not subject to environmental cracking.

Extremely light in weight, tough, yet flexible, it resists the stresses encountered during installation. You can expect top performance of Telecable for upwards of 20 or 25 years.



Telecable exchange area cable has outstanding weather resistance and transmission qualities.

Available in No. 24, No. 22 and No. 19 A.W.G. in sizes up to and including 404 pairs.

Did you know . . . that the Stromberg-Carlson general catalog has more than 100 pages of maintenance and construction supplies alone? You can do *all* your business "under one roof" and find the same quality and reliability in every item.

Distributed by

STROMBERG-CARLSON

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 6, Chicago 6, Kansas City 8, Rochester 3, San Francisco

Name Nebraska Association Secretary-Treasurer

J. Earl Nelson of Webster City, Ia., became secretary-treasurer of the Nebraska Telephone Association on June 1. He succeeded acting secretary-treasurer Fred M. Strasser of Lincoln.

J. E. NELSON

Mr. Nelson was associated with the Northwestern Bell Telephone Co. from 1930 to 1951. Starting as an installer-repairman in 1934, he later worked on conversion to automatic as supply supervisor at Des Moines, Cedar Rapids, Iowa City and other points before becoming a commercial clerk at Webster City in 1934. He was manager at Vinton and Perry before becoming district plant supervisor at Waterloo in 1941 where he had plant supervision of 60,000 stations in 25 exchanges. While at Waterloo he supervised the installation of K and L carrier systems for Waterloo, Mason City and Ft. Dodge.

He became a contractor in 1951 in line clearance of trees for telephone and power companies and became an automobile dealer in 1953.

In recent years he has engaged in engineering and appraisal work for Independent telephone companies in Iowa, assisting in the appraisal of plant and laying out plans for line, cable and other requirements for dial conversions.

Born in Kossuth County, Iowa, Mr. Nelson graduated from the Milford, Ia. high school in 1925 and then attended Iowa State College in the study of general engineering. He worked part time for Northwestern Bell as a groundman and lineman while attending school.

Need for Doers

"The actual fact is that in this day Opportunity not only knocks at your door but is playing an anvil chorus on every man's door, and then lays for the owner around the corner with a club. The world is in sore need of men who can do things."—ELBERT HUBBARD.

California Water & Tel. Names Lindholm Treasurer

Ben A. Lindholm, general auditor of California Water & Telephone Co. since 1939, has been elected treasurer of the company, President Chester H. Loveland has announced.

B. A. LINDHOLM

Mr. Lindholm replaces Guy D. Lamp who retired on May 1 after 34 years with the company. The new treasurer joined an early predecessor of the company in 1928 as an accountant in the San Francisco headquarters. When the present corporate name was assumed in 1935 he was appointed assistant to the general auditor.

General of Ohio Sells Bond, Stock Issues

General Telephone Co. of Ohio on May 28 sold at par 3 million dollars principal amount of first mortgage bonds, 4¾ per cent series due 1987. The bonds were placed privately with six institutions.

At the same time General of Ohio sold 200,000 shares of its common stock for one million dollars to General Telephone Corp. The funds secured by General of Ohio will be used to retire notes covering loans from banks and for 1957 construction.

Thoughts on Accomplishment

"Some men give up their designs when they have almost reached the goal; while others, on the contrary, obtain a victory by exerting at the last moment, more vigorous efforts than before."—POLYBIUS.

Carolina T&T Elects Four Top Executives

Four telephone company executives were elected to top positions on May 10 at the regular quarterly meeting of the board of directors of Carolina Telephone & Telegraph Co.

J. R. Porter, one-time president and immediate past chairman of the board of directors, was elevated to the position of honorory chairman of the board of directors. L. W. Hill, president of the company since 1945, was elected as chairman of the board of directors while H. Dail Holderness, former vice president, secretary and treasurer, was elected president. J. R. Fowler, former assistant secretary and assistant treasurer, was elevated to the position of secretary and treasurer.

Honorary Board Chairman J. R. Porter began his telephone career in 1900 with the Cumberland Telephone Co., a small Independent company later purchased by Southern Bell Telephone & Telegraph Co.

In 1918, he joined Home Telephone & Telegraph Co., an Independent company with headquarters at Henderson. He was general manager of that company from 1918 until it merged with Carolina Telephone & Telegraph Co. in 1926, when he became executive vice president of the merged company.

L. W. HILL

H. D. HOLDERNESS

In 1940, Mr. Porter became president of Carolina Telephone & Telegraph Co., succeeding George A. Holderness. He served in that capacity until 1945, when he became chairman of the board of directors, in which post he has been active until the present.

Succeeding Mr. Porter as chairman of the board of directors is L. W. Hill.

Mr. Hill became president of Carolina Telephone & Telegraph Co. in 1945 and has served as the company's president during a period that has seen the company grow from a 10-million-dollar to a 70-million-dollar corporation. At the end of 1945, the company had less than 50,000 telephones. Today, it has in excess of 145,000 telephones in its 41-county operating territory.

A native of South Carolina, Mr. Hill graduated from the University of South Carolina with a B.S. degree in 1915, and later received a degree in Civil Engineering. Upon graduation, he entered the service of Southern Bell Telephone & Telegraph Co., where he served approximately one year before entering the United States Army in 1917.

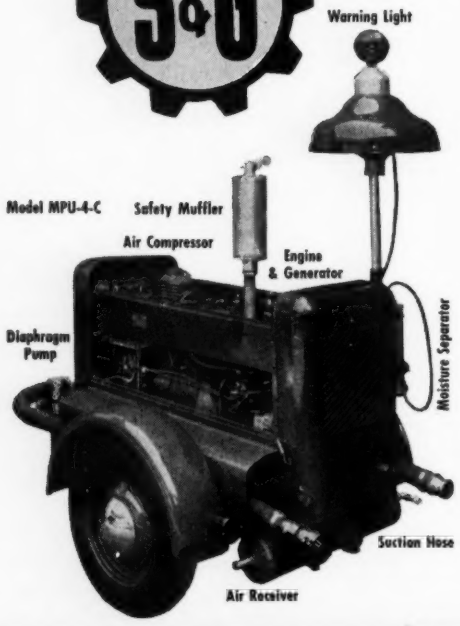
Entering as a private in the Signal Corps, Mr. Hill later transferred to the air service, became a pilot and was commissioned a second lieutenant.

Following military service, Mr. Hill returned to the employ of Southern Bell where he served in various capacities in the engineering and plant departments until 1943. He was then elected operating vice president of Carolina Telephone & Telegraph Co., a position he held until his election as the company's president in 1945. His 12 year tenure in that office has been the longest ever served in that capacity for the Carolina company.

Active in numerous civic, church and business organizations, Mr. Hill is a fellow member of the American Institute of Electrical Engineers, a member of the American Society for Testing Materials, and of the president's council of the American Institute of Management; past president and member of the board of directors of the United States Independent Telephone Association; past president, past secretary and past treasurer of the North Carolina Independent Telephone Association, the standards council of the American Standards Association, director of security, National Bank & Trust Co.,

dependable . . . versatile . . .

S&G Mobile Power Unit

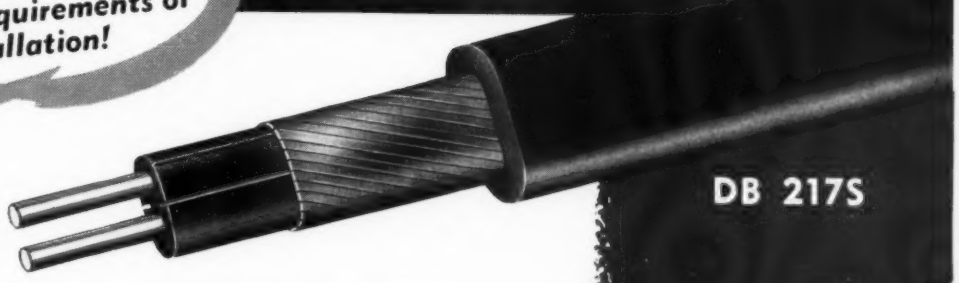


- Generator (slow speed for quietness) 2500 Watt, 110-Volt DC
- Pump—2800 GPH Diaphragm to remove seepage and drain back
- Air Compressor—to put cables under pressure for cut-overs or repairs
  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cut-overs, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • RAymond 3142

OF THESE 3 TYPES OF
SUPERIOR
DIRECT BURIAL WIRE
...one will "do the trick" for you!

Buy SUPERIOR DIRECT BURIAL WIRE to match the requirements of your installation!



DB 217S

1 **Need wire having maximum resistance to damage from road or farm machinery and implements . . . or other similar sources?**

Order the SUPERIOR DB No. 217S with spiraled flat steel strip shield and green jacket.

DB 217B

2 **Need wire to resist damage from insects and rodents . . . or peculiar soil conditions which are conducive to increased lightning activity?**

Order SUPERIOR DB No. 217B with longitudinal bronze shield and yellow jacket.

DB 217

3 **Need wire for direct burial installations in areas where conditions are normal and no specific hazards are likely?**

Order SUPERIOR DB No. 217 non-armored type with red jacket.

INDEPENDENT

Order SUPERIOR Direct Burial Wire NOW or write for complete information to

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION • Hickory, North Carolina

XUM

and a trustee of the North Carolina Wesleyan College that is being founded in Rocky Mount.

Succeeding Mr. Hill as president of Carolina Telephone & Telegraph Co. is Haywood Dail Holderness, son of the late George A. Holderness, founder and past president of the company.

A native of Tarboro, Mr. Holderness has been vice president, secretary and treasurer of Carolina Telephone & Telegraph Co. since 1945.

He is a graduate of the class of 1930 at the University of North Carolina where he received an A. B. degree, and of the Wharton School of Finance at the University of Pennsylvania where he received his M. S. degree in business administration.

Mr. Holderness began his telephone career in 1933 as a clerk in the company's traffic department where he became traffic manager, then was transferred subsequently to the treasury department as assistant treasurer. In 1937, he was made secretary and treasurer of that department and in 1945, became vice president, secretary and treasurer of the company.

Active in civic, business and professional affairs, Mr. Holderness is a director and member of the executive committee of Carolina Telephone & Telegraph Co., director of Edgecombe Bank & Trust Co., and Edgecombe Homestead & Loan Association of Tarboro, past president and past secretary of the North Carolina Independent Telephone Association.

J. R. Fowler, assistant secretary and assistant treasurer since April 1, succeeds Mr. Holderness as secretary and treasurer.

Personal Resolution

"You may be whatever you resolve to be—Determine to be something in the world, and you will be something. —'I cannot,' never accomplished anything; 'I will try,' has wrought wonders."—J. HAWES.

Answers to Questions On Page 32

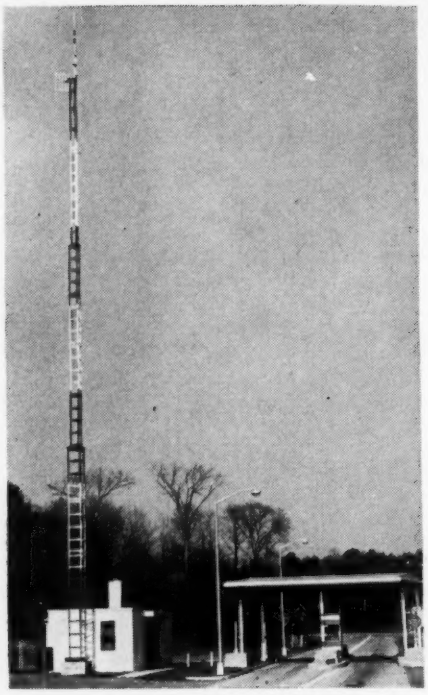
(1) Say, for example, "Main 1234 has been disconnected."

(2) Say, "At the subscriber's request (called number) has been temporarily disconnected."

(3) Say, for example, "Calls for 3-1768 are being temporarily referred to 9173."

(4) Say, "Called number is a party line. What letter, (ring) please?"

(5) The operator will say, "There is no (called number)."



Communication's Most Versatile Tower . . . the STAINLESS "SC" (Self-Supporting)

- Clean, economical, dependable structure
- Serves many purposes
- Space-saving uniform cross-section
- Easy to erect
- "Natural ladder" construction affords easy maintenance

Quick, expeditious handling of communications is assured year-'round by this clean, economical and dependable self-supporting structure.

The SC Tower is sturdy, and being free of guy cables is particularly adaptable where land space is at a premium.

Available as straight uniform cross-section for short heights, graduated uniform cross-sections for taller use.

Call or write for details.

Stainless, inc.
NORTH WALES • PENNSYLVANIA

FAST, LOW-COST WAY TO INSTALL PIPE . . .

push it under streets, roads, tracks, lawns with a timesaving

GREENLEE HYDRAULIC PUSHER

Speed underground piping jobs this way. GREENLEE Pusher is one-man-operated (by hand or with power pump), portable, simple to set up and use. No tearing up of pavement, floors, lawns . . . does away with extensive ditching, tunneling, backfilling, repaving. GREENLEE Pusher cuts job time to a fraction . . . often pays for itself on first job.

Two feet per minute average pushing time

GREENLEE Pushers are available in two sizes: No. 790 for ¾" to 4" pipe . . . No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.

GREENLEE

GREENLEE TOOL CO.
2066 Columbia Avenue • Rockford, Illinois

R. Davidson Promoted to Stromberg Engineering Post

Richard Davidson has been promoted to the position of service engineer for the territory served by the Chicago branch office of Stromberg-Carlson, including the states of Indiana, Michigan, Illinois, Iowa, Wisconsin, Minnesota, North and South Dakota.

RICHARD DAVIDSON

Announcement of his appointment was made by David Balis, manager of installation and service, telecommunication division. Stromberg-Carlson is a division of General Dynamics Corp.

Mr. Davidson came with Stromberg-Carlson in 1951 after attending the Veterans Vocational School, University of the State of New York, where he majored in electrical engineering. Prior to attending school he was associated with the Western Electric Co. as an installer. He is a veteran, having enlisted in the army in 1945 in London, England.

At Stromberg-Carlson he began as an installer of "XY" automatic central offices, and soon was promoted to installation foreman.

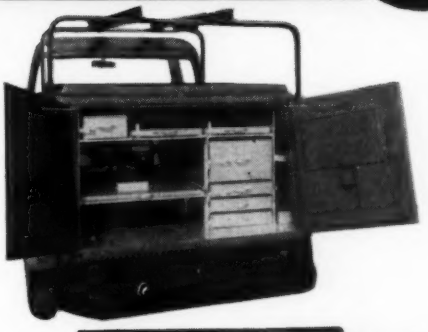
Maj. Gen. Code Retained as Consultant at Lenkurt

Maj. Gen. James A. Code Jr., USA (Ret.) formerly Deputy Chief Signal Officer of the Army, has been retained as consultant to the general commercial relations manager of Lenkurt Electric Co.

Since his retirement from the Army, General Code has been an officer and director and has acted as chief executive of many telephone operating and communications manufacturing companies, both in the United States and abroad.

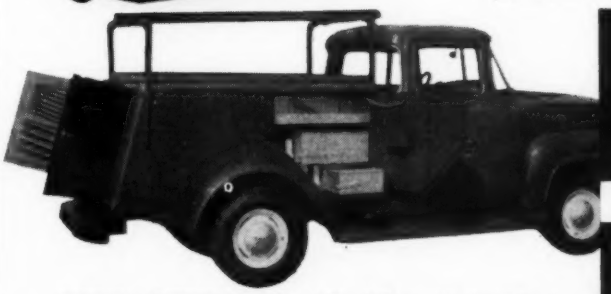
A graduate of the United States

SERVICE BODIES by UTILITY BODY OAKLAND



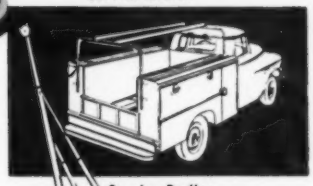
Series I-40
INSTALLERS BODY

Special Truck Body developed for telephone installation and service work. Provides maximum storage space for necessary parts and materials, readily accessible, easily inventoried. An advance design incorporating all the latest features—easily adapted to varied urban and rural service problems.



OVERALL LENGTH is 81", width 58" (approximately 6 feet across fenders). Length at top, 72¼", length at floor line, 79¼". Body designed for installation on any standard chassis with a 38" to 42" cab-to-rear-axle dimension. Space provided for either 4-foot or 6-foot ladders as specified and for all normal telephone installation and maintenance equipment—apparatus, directories, pay-out reel, wire, belts and materials. Spare tire is carried on special sliding tray in left-hand compartment.

Personnel Carrier Service Bodies



Service Bodies

Line Construction Service Bodies & Hydraulic Derricks

UTILITY BODY COMPANY
1530 WOOD ST. • OAKLAND, CALIF.

Please send price and delivery information on Series 1-40 Installers Body. I would also like information on:

☐ Personnel Carrier Service Bodies ☐ Service Bodies ☐ Line Construction Service Bodies & Hydraulic Derricks

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

MAIL COUPON TODAY

Check any additional information you would like.

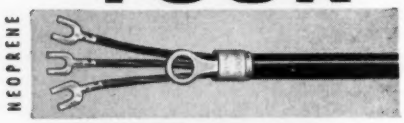
Distributors in all leading cities

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

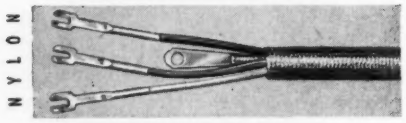
XUM

CORDS BY Runzel

YOUR



BEST



BUY!

Are you familiar with the features of these fine cords?

NEOPRENE covered cords are a highly serviceable cord, extensively used in a wide variety of services. They are moisture and grease proof . . . easy to keep clean.

NYLON covered cords are a relatively new development in telephone cords. Their fine smooth texture makes them the preferred cords for switchboard use. They give long service. Preferred by operators because of their fast, easy handling.

COTTON cords are in standard use everywhere. Their fine woven wrap makes them very serviceable for all around purposes.

Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry a large stock of cords for every purpose.

Our geographical location means QUICK SERVICE.

RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.

Military Academy at West Point, he also holds the Master of Science and Electrical Engineer degrees from Yale University.

General Code is a senior member of the American Institute of Electrical Engineers, the Institute of Radio Engineers, the American Signal Corps Association and the American Association for the Advancement of Science.

C&D Names H. Taylor to Engineering Department

Harrison Taylor has joined the headquarters service division of the engineering department at C&D Batteries, Inc., the Conshohocken company has announced. C&D manufactures industrial storage batteries for powering

HARRISON TAYLOR

electric lift trucks, for the telephone industry, for railroads, mining, control, and other industrial applications.

Mr. Taylor comes to C&D following 35 years' service with Electric Storage Battery Co. He went to work for Exide back in 1921 as an operating engineer in the Philadelphia area, continuing in this assignment for four years. In 1926, Mr. Taylor was transferred to the company's Atlanta, Ga., territory, where he worked as a service engineer for 27 years. Three years ago, he returned to Philadelphia to fill the position of staff engineer in Exide's general offices service division.

During his many years in the Georgia area, Mr. Taylor worked closely with battery customers. He participated in Bell Telephone Co.'s power plant schools, and also gave talks on storage batteries to telephone companies, railroads, and industrial plants.

Mr. Taylor attended Germantown High School, Drexel Institute, and the University of Pennsylvania. He is a member of the American Institute of Electrical Engineers, National Society of Professional Engineers, and the Pennsylvania Society of Professional Engineers.

Ansonia Wire & Cable Holds May Sales Meeting

Walter G. Pearson, director of sales of The Ansonia Wire & Cable Co., announced that a general sales meeting was held May 15 and 16 at the company's new offices in Ashton, R. I.

In attendance were Tilden E. Thompson, assistant sales director; Raymond Blythe, John Marsh, William Johnson, Arthur Schell, Frank Morris, Walter Storer, Kenneth Gillette, sales representatives; and Ralph Engsberg and Manley Mallard, sales engineers. Also in attendance were Frederick Corcoran and William Clifford of the home office sales staff.

Field sales representatives and engineers from all Ansonia territories made this special trip to Ashton to hear Mr. Pearson introduce a new product, fully color coded telephone cable, the first available from stock, and present new sales literature on several Ansonia product groups.

Among other matters discussed or reviewed, the group heard a recapitulation of Ansonia's advertising and sales promotion program given by Shel-

Haley's
CEDAR POLES
and FIR CROSS ARMS
LOW CONDUCTIVITY AND SAFER WITH PENTACHLOROPHENOL FULL-STRENGTH TREATMENT
CLEAN • DRY
LONGER LIFE
LIGHT WEIGHT
MINNEAPOLIS
FINDLAY, OHIO
R. G. HALEY & CO.
SPITZER BUILDING
TOLEDO 4, OHIO

don D. Spencer, vice president of Ansonia's advertising agency, The George T. Metcalf Co. It was pointed out that the present program represents the largest advertising investment in history for Ansonia.

IT&T Announces Election Of Two Key Officials

At a meeting of the board of directors of the International Telephone & Telegraph Corp. immediately following the annual meeting of the corporation, Fred M. Farwell was elected an executive vice president.

He will be in charge of research and manufacturing activities in the United States, it was announced by Edmond H. Leavey, president. Mr. Farwell was formerly president of the Underwood Corp.

Mr. Leavey also announced that C. Douglas Webb has been elected secretary of IT&T. Mr. Webb succeeds Geoffrey A. Ogilvie, who has retired.

Lenkurt International to Open Venezuelan Branch

Lenkurt International Corp., an affiliate of Lenkurt Electric Co., will open a branch office this summer in Caracas, Venezuela.

David J. Hadley, from the electronic communications firm's San Carlos, Cal., general offices, sailed from New York on May 31 to assume his new post as manager in Caracas.

The international affiliate was formed last year to handle sales between the Lenkurt plants in San Carlos, Mexico City, and Burnaby, B. C. It also transacts business with the firm's world-wide distributors, Automatic Electric International, and gives field support to the distributor and its subsidiaries.

Elected to Anaconda Board

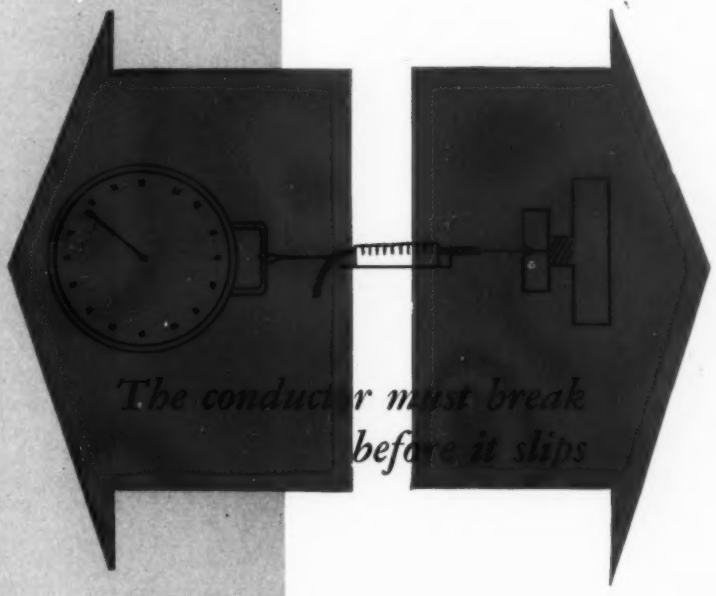
David E. Allen, vice president-sales of Anaconda Wire & Cable Co. has been elected to the board of directors of the company. The announcement was made by William E. Sprackling, president and director, following a meeting of the board.

People and Automation

"With all the progress in engineering and the physical sciences, the human factor is still the most important. The further we go in automation and the faster we go in developing machines to take the place of people, the more important people become. But the people must be of a higher and higher order."—LEWIS B. LUNDBORG, *vice president, Bank of America.*

ALPHADUCT

P clamp adhesion test



P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY • NEW BRUNSWICK, N. J.

NATIONAL DISTRIBUTORS • AUTOMATIC ELECTRIC SALES CORP., CHICAGO, ILL.
LEICH SALES CORPORATION, CHICAGO, ILLINOIS
REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO., CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

XUM

KLEIN

preferred by linemen
. . . electricians

When it comes to leather goods for linemen or electricians, the name Klein today stands for the highest in quality as it has since the first wires were strung.

In Klein-Kord, too, Klein offers to industry the first specially woven fabric for safety straps—a fabric designed to permit the use of a tongue-type buckle without the risk of slitting or ripping under severe strain.

Now in Nylon Klein-Kord safety straps Klein still leads with the newest in safety equipment specially designed for use by utilities wherever power or communication lines are strung.

Write for Free Tool Guide
A free copy of the new Klein Pocket Tool Guide will be sent to anyone interested on request.

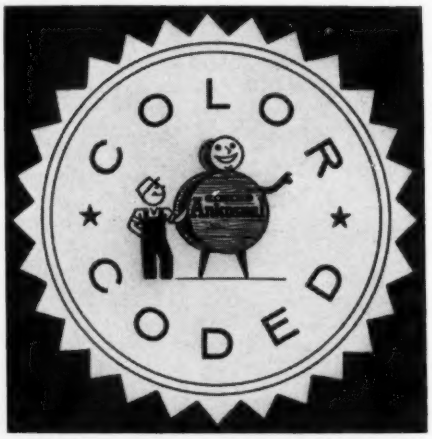
Ask your supplier

Foreign distributor:
International Standard Electric Corp., N.Y.

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

News on New Products

COLOR CODED CABLES — Walter G. Pearson, sales director of The Ansonia Wire & Cable Co., has announced the company's introduction of a complete line of fully colored coded telephone cables for the communication industry.



Mr. Pearson stated that all Ansonia Ankoseal exchange cables in sizes 6 pr. to 101 pr. in layer construction and in group construction over 101 pr. are now color coded and that at this time these color coded cables would be offered at the same regular prices.

These color coded cables provide all of the performance characteristics of Ansonia exchange cables including freedom from cross talk and circuit unbalance, he said.

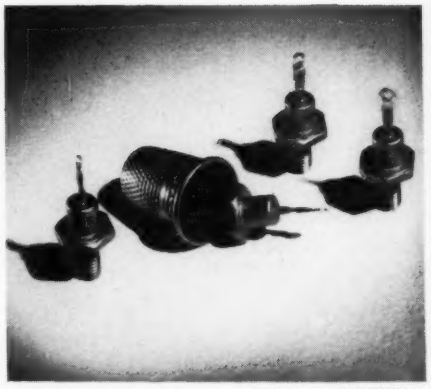
Ansonia, Ankoseal color coded cables permit easier splicing in less time than ordinary cables and field reports indicate that substantial savings can be realized in installation and maintenance, he added.

The announcement of this new color coded cable line is, Mr. Pearson stated, in direct reply to repeated customer requests.

Ansonia will affix a special coded cable seal (see cut) to each reel carrying these cables to make shipping identification easier. Request NP673.

•

SILICON RECTIFIERS — The General Electric Co. has announced the development of a line of 170°C. stud-mount silicon rectifiers for use in military and commercial equipment power supplies.



The four new rectifiers, RETMA-designated 1N1115, 1N1116, 1N1117, and 1N1118, are now in mass production at the company's semiconductor products plant.

According to General Electric engineers, the absence of aging effects in silicon rectifiers assures exceptional reliability and uniformity of characteristics over the full life of the devices. In addition, they need not be redated for industrial applications.

The rectifiers have peak inverse voltage ratings of 100, 200, 300 and 400

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP673_____; NP674_____; NP675_____; NP676_____;

NP677_____.

Name..... Title.....

Company .....

DEPARTMENT OF TECHNOLOGY
BUFFALO AND ERIE COUNTY PUBLIC LIBRARY

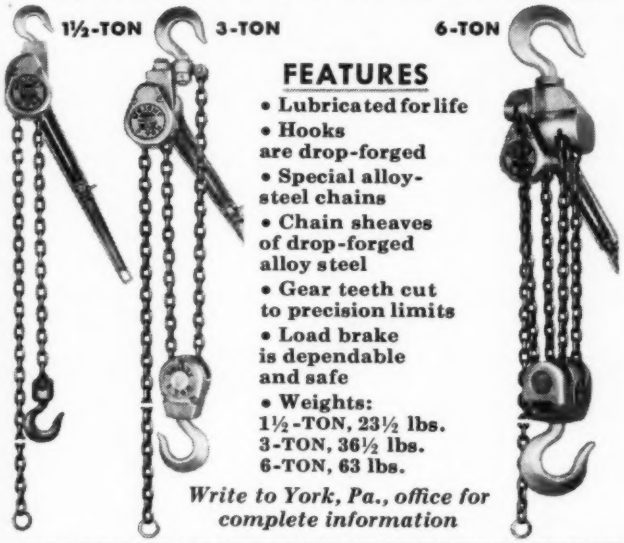
Street .....

Town and State.....

6/8/57

NEW WRIGHT Type "C" Pull-A-Ways

THREE SIZES—1½, 3 and 6-Tons



FEATURES

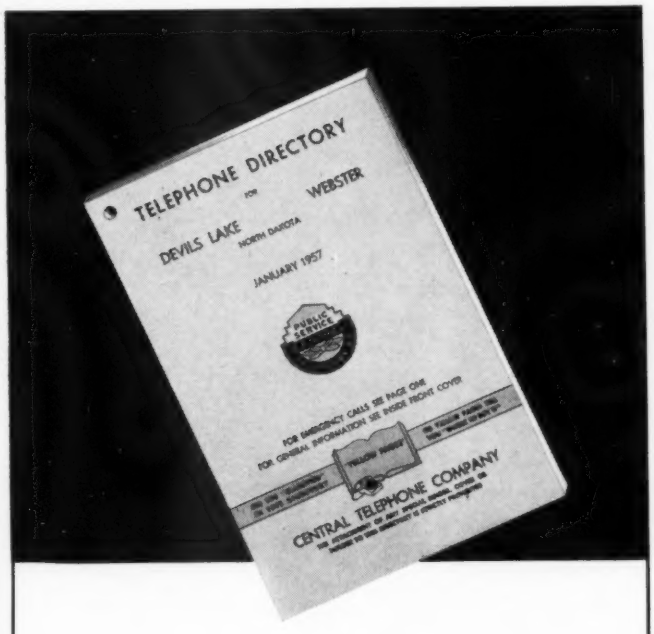
- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights: 1½-TON, 23½ lbs. 3-TON, 36½ lbs. 6-TON, 63 lbs.

Write to York, Pa., office for complete information

Wright Hoist Division
AMERICAN CHAIN & CABLE

ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.



A directory for the
Central Telephone Company, North Dakota
printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

RESISTS OLD AGE

THANKS TO "YOUNG PROCESS"!

Kennecott's exclusive "Young Process" lead sheath does much to lengthen the life of Kennecott Telephone Cable. This sheath production method virtually eliminates oxides and impurities! Sheath is far more uniform in strength and burst resistance, with greatly reduced weld area. It provides increased protection against damage and aging. Cable retains full electrical properties over its long life! Contact the Chase sales office near you for full information.

IT'S KENNECOTT TELEPHONE CABLE

CHASE BRASS & COPPER CO., WATERBURY 20, CONN.
DISTRIBUTOR FOR

KENNECOTT WIRE & CABLE CO.

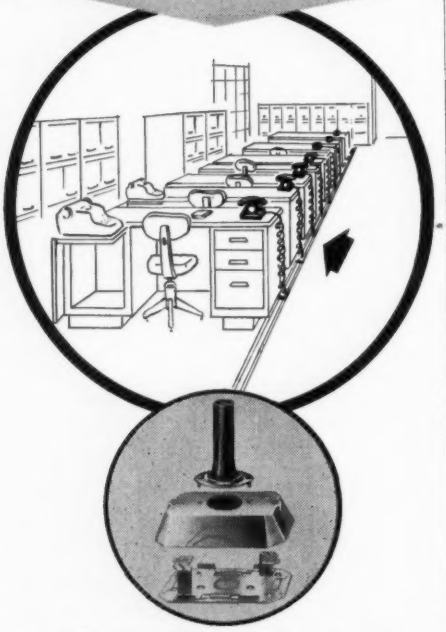
SUBSIDIARIES OF KENNECOTT COPPER CORPORATION

CHASE WAREHOUSES and OFFICES:

Atlanta	Cincinnati	Grand Rapids	Milwaukee	New Orleans	St. Louis
Baltimore	Cleveland	Houston	Minneapolis	Philadelphia	San Francisco
Boston	Dallas	Indianapolis	Newark	Pittsburgh	Seattle
Charlotte	Denver	Kansas City, Mo.	New York	Providence	Waterbury
Chicago	Detroit	Los Angeles	(Maspeth, L. I.)	Rochester	

XUM

PANCAKE
is the
Modern Way
to carry
communications
wiring to the
point of use!



Pancake is the streamlined, modern method of making individual telephone connections to office desks or communication points in factories. The galvanized steel, *trip-proof* surface raceway can be quickly and economically installed with a *minimum* of interruption to office or factory routines.

Features added to the newly developed 1546T Telephone Outlet Box, *illustrated above*, provide (1) an ingress for 2600 Pancake, and (2) the "split bridge", which extends the versatility of this fitting, provides a more simple means for the installation of the 47B terminal block, and facilitates the use of the fitting for through wiring.

Specify 1500 Pancake for JKT Conductors; 2600 for telephone cable.

For further information write Dept. T-4

THE WIREMOLD COMPANY
HARTFORD 10, CONN.

volts with maximum RMS voltage ratings of 70, 140, 210 and 280 volts respectively.

They are designed for a maximum output of 600 milliamperes at a case temperature of 150°C. At 85°C. the devices have a maximum allowable DC output current rating of 1.5 amperes.

All four rectifiers are capable of withstanding a maximum one-cycle surge current of 15 amperes.

The maximum full cycle average full load voltage drop at 150°C. is 0.65 volts while the maximum average leakage current at that temperature is 0.4 ma. for the 1N1115 and 0.3 ma. for the other three rectifiers.

Maximum operating frequency for the new silicon rectifiiers is specified as 1000 kilocycles.

The rectifiers have been designed with a 10-32 stud for direct chassis mounting, and theey are housed in a welded, all-metal case for maximum reliability.

The new General Electric silicon rectifiers will meet military mechanical specifications for rectifiers. Request NP674.

•

COMBINED "GRASSHOPPER" FUSE-HEAT COIL—The "grasshopper" fuse and the heat coil, both widely-used throughout the communications and electronic equipment fields, have been combined into a new, resettable, positive-acting fuse, arc-free and with accurate operation time, the Wirecom division of Cook Electric Co. has announced.

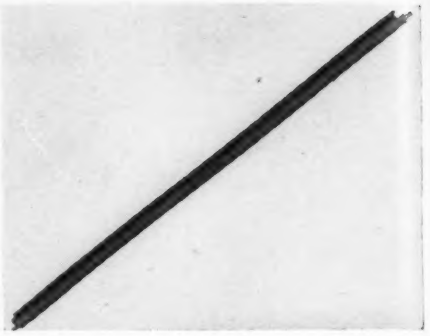
The company points out that the advantages of the new, combined product, now in production, include economy, sturdy construction, elimination of the fragile fuse wire, and easier packaging, handling, installation and maintenance.

After trouble has been cleared, the "grasshopper" fuse with heat coil is set again by re-engaging the heat coil ratchet.

The fuse-heat coil combination provides an improved method of protecting circuitry and components, and is ideal for actuating alarm circuits or grounding out stray or axcessive currents, the company stated. Request NP675.

•

ALUMINUM ALLOY GUY PROTECTOR—An aluminum allow guy protector has been developed by Hubbard & Co. as an addition to its line of aluminum pole line hardware. It is intended particularly for use in areas where the action of industrial gases or seacoast atmospheres causes abnormal corrosion of steel. Hubbard & Co. also makes



guy protectors in Corten steel and in light and heavy galvanized steel.

The new protector comes in two sizes, No. AL-27, 7 feet long, and No. AL-28, 8 feet long. The protector is made in a half-round design, with the edges turned in lengthwise for added rigidity, giving it high strength in spite of its light weight which is only about half that of the galvanized steel type.

Attachment holes are spaced so they have universal application to the guy wire. Top attachment is by means of a clip arrangement.

The bottom bolt is 2½ inches long, permitting attachment to be made over the rod or the strand between the eye and the clamp. Installation can be made on the clamp by substituting the protector bolt for one clamp bolt. Request NP676.

•

MINIATURIZED CARRIER SYSTEM—A miniaturized multiple-channel telephone carrier system—the first of its kind ever made available for military use—has been developed for the U. S. Army Signal Corps by Lenkurt Electric Co.

This system, which marks a new step in electro-mechanical design of carrier equipment, was unveiled recently at the Armed Forces Communications & Electronics Association convention in Washington, D. C.

Completely transistorized and extremely compact, the new "tactical telephone terminal" is about one-seventh the size and one-third the weight of similar equipment now in use. It can

One Man
Working Alone
Can Identify
Non-Working
Cable Pairs
3 Times Faster
Than 2 Men
Working Together
If He Uses
The Murphy
ONE-MAN
Cable Tester

MURPHY
One-Man Cable Tester

SAVE time . . . money . . . manpower with Murphy One-Man Cable Tester. Thousands are already in use by progressive telephone companies all over the world.

MANY NEW PRODUCTS IN DEVELOPMENT STAGE

Murphy Engineering Laboratories are working on a wide variety of new products that will help you save vital manhours. If you would like to keep informed about these products send your name and address to our office and we'll put you on our mailing list.

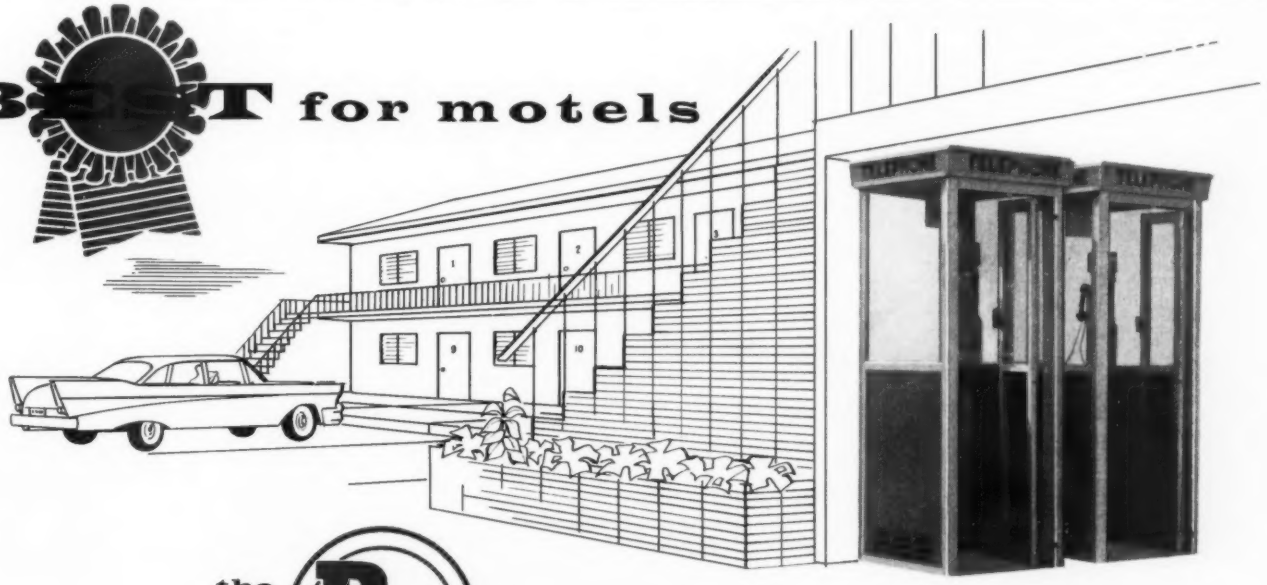
ELECTRONIC RESEARCH DEVELOPMENT MANUFACTURE

MURPHY ENGINEERING LABORATORIES, Inc.

OVerland 2-4000

4419 TULSA • HOUSTON, TEXAS

BEST for motels



the **BN Booth**

attracts the eye day or night,
promotes more revenue. Colorful, clean, sturdy—
the BN Booth is best for you, too!

For full particulars, consult your distributor or write direct for folder... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

XUM

Stewart

TEST EQUIPMENT

Locates Trouble FAST

1000 Cycle
TRANSISTOR
OSCILLATOR

Model J

A Stable power source, for locating trouble in carrier systems and audio equipment.

Self contained mercury battery with operating life over 700 hours.

Pocket size, 2¼"x3"x4", Wt. 10.3 Oz.

STEWART BROTHERS
Division of Instrument Laboratories
Chicago 10, Illinois

IF YOU USE THESE PRODUCTS . . .

send for the world's most complete, illustrated catalog of

ELECTRIC LANTERNS and SAFETY CANS

VALUABLE DATA:

The world's first comprehensive table of lamp and battery operating information
High power searchlights
All-purpose hand lights
Safety lights and lanterns
Flammable liquid SAFETY CANS
Oily Waste Cans

JUSTRITE Mfg. Co.
2061 N. Southport, Chicago, Ill.

CATALOG NUMBER 569-N6

be handled easily by one man (see photo accompanying, in which Lenkurt Electric's Paula Woodruff displays the new terminal).

It provides four voice channels and an order wire for either radio or cable transmission. Four terminals can be stacked together to provide a 16-channel system.

Designed for mounting in military vehicles, the terminal takes only 3½ inches of vertical space in a standard 19-inch telephone equipment rack. It weighs 65 pounds compared to 170 pounds for the AN/TCC-3 terminal used by the Signal Corps since 1952 (at left in accompanying photo). The CF-1 field terminal developed during World War II weighed nearly 500 pounds.

This is the first all-transistor miniaturized telephone carrier system to use the frequency-division method in providing extra voice channels for both radio relay and standard spiral-four cable facilities. It requires less than half the power needed by the AN/TCC-3.

It also makes use of an unique "egg-crate" type of chassis construction designed to meet military environmental and strength requirements at minimum weight. Unitized plug-in subassemblies are hermetically sealed.

The terminal has built-in facilities for 3750-cps out-of-band AM signaling, from which E and M signaling can be derived. A separate signal option unit, 1¾ inches high, provides four more types of signaling (ac ringdown, plug supervision, straight-forward and dial).

Four experimental models have been supplied to the U. S. Army Signal Engineering Laboratories at Fort Monmouth, N. J. Request NP677.

Government Grants

"Government cannot give away what it does not possess. Government does not produce the economic goods it promises to dispense. People produce them. Before government can give you anything, it must first take it away from someone else. Conversely, before it can give somebody else anything, it must first take it away from you."—BEN MOREELL, *chairman of the board, Jones & Laughlin Steel Corp.*

Worthy Attribute

"I am a little thing. I cost nothing. I am worth more than gold to you. The more you use me, the more you have. I unlock doors, open hearts, dispel prejudices. I make friendships. I inspire respect and admiration. I am always welcome. I bore nobody. I violate no law. No one condemns me. I am pleasing to everybody. I am indispensable. I am courtesy.—AUTHOR UNKNOWN.

CABANISS-POGUE COMPANY
Consulting Engineers
Appraisals—Cost and Rate Studies
Financial Assistance
GRANT BLDG., ATLANTA, GEORGIA

CARL C. CRANE, INC.
Consulting Engineers
2702 Monroe Street, Madison 5, Wis.
Telephone CEDAR 3-4210

McGRATH
ENGINEERING, INC.
Consulting Engineers
209 West 6th Street
TOPEKA, KANSAS
Telephone 2-2358

SLOAN, COOK & LOWE
CONSULTING ENGINEERS
Appraisals—Original Cost Studies
Plant, Traffic and Commercial
Engineering
120 S. La Salle St.
Chicago 3, Ill. Tel.: FRanklin 2-5924

INSPECTION SERVICE AT
TIMBER TREATING PLANTS
Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Consulting and specification writing.
Inspectors stationed throughout U.S.A.
A.W.WILLIAMS INSPECTION CO., INC.
MOBILE, ALABAMA

ATLANTIC
Creosoting Co., Inc., 17 Battery Pl., N. Y. C.
Creosoted Pine Poles • Crossarms
PLANTS AND OFFICES
Boston, Mass. Portsmouth, Va.
New York, N. Y. Philadelphia, Pa.
Savannah, Ga.

L. D. McFARLAND COMPANY
Box 390 • Sandpoint, Idaho
WESTERN RED CEDAR, DOUGLAS FIR, WESTERN LARCH AND LODGEPOLE PINE. CREOSOTE AND PENTA BUTT OR FULL-LENGTH TREATED POLES.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co.—Northern White Cedar Poles, Pentachlorophenol treated. Plant and Yards, Phelps, Wis.

Dierks Forests, Inc. (formerly Dierks Lumber & Coal Co.) Wood Preserving Division, 810 Whittington Ave., Hot Springs, Arkansas. Southern Pine select poles, all sizes and lengths, creosote and penta-pressure treated. Prompt shipment.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

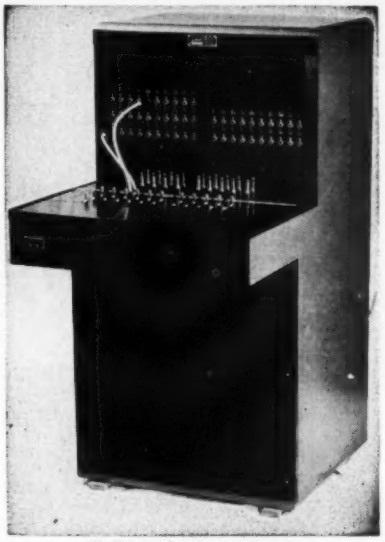
International Paper Co., Long Bell Division, 926 Grand Ave., Kansas City, Mo. —Pressure-treated Southern Pine and Douglas Fir Poles. Creosote and Penta preservatives.

Montana Pole & Treating Plant—Box 2004, Butte, Montana. Penta-Pressure treated Lodgepole Pine and Western Larch Poles. Inquiries invited.

Texas Creosoting Company—512 Main Street, Orange, Texas—Creosoted Southern Yellow Pine and Douglas Fir Poles. Can also treat with "Penta."

Complete outside telephone plant builders. From frame to the phone

MULLEN CONSTRUCTION COMPANY
2002 E. Wisconsin Ave. REgent 4-9881
Appleton, Wisconsin


Kellogg (actual photo)

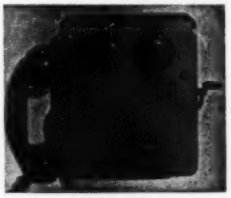
MAGNETO EQUIPMENT

Kellogg & Stromberg Carlson

←*(photo to left)*

New 100 line—50 equipped with combined drops & jacks, wired to 15' 51 pr. braid cable stub—Night alarm ckt. (no code alarm) 10 cord circuits (single supervised) with repeating coils. Standard-low type, 30" cord-shelf (desk height) built for Navy—never used—Hardwood (birch or maple) cabinet, painted green.

Clean as a whistle—tested—
fully guaranteed $295
Prints on request.
PBX Boards, W.E., Kellogg, S.C.


5812 MX

Brand New $12.50 each in std. package of 8 Kellogg #5812 MX

5 bar, 1600 ohm, anti-sidetone circuit. Complete with F27 handset, coiled cord. Oak cabinet, painted dull green. New and perfect—original factory pack. (2500 or 1000 ohm ringer $1.50 extra.)
Less than 8, each $13.50

Shipped on approval — we pay two-way freight if you are not entirely satisfied.

The Telectric Co.
1218 VENICE BOULEVARD LOS ANGELES 6, CALIFORNIA
Richmond 8-2249

CABLE SPLICERS • LINEMEN
STATION INSTALLERS
STEADY WORK, GOOD PAY
MIDWEST LOCATION.
The Weikel Line Company, Inc.
FORT WAYNE, IND.

KILLOREN COMPANY
Construction crews—Installers
Cable Splicers
30 years experience
136 N. State St. Appleton, Wisconsin
REgent 3-5549

HARRIS-McBURNEY CO.
PUBLIC UTILITY CONSTRUCTION
A complete construction service for the telephone industry
Construction Crews Engineering
Station Installers Appraisals & Reports
Cable Splicers C. O. Installation
Underground Duct Systems
Telephone ST 4-6126
P. O. Box 267 Jackson, Michigan

ORDER FROM L. E. S. AND PAY LESS
LINEMEN'S CONSTRUCTION TOOLS
PROMPT DELIVERY FROM STOCK
Send for Bargain Stock List No. LT.
LINE EQUIPMENT SALES
529 So. Dearborn St., Chicago 5, Ill.

YATES CONSTRUCTION CO.
"Specializing in Telephone Construction"
Cable Splicers, Telephone Installers, Equipment Installers, Construction crews.
1507 SOUTH SIXTH ST. PADUCAH, KY.
TELEPHONE 2-4623

Construction Crews Station Installers
Central Office Installations
Cable Splicers Complete Engineering
HENKELS & McCOY
6100 North 20th Street Philadelphia, Pa.
Now Operating in 30 States
OFFICES LOCATED AT
Elkhart, Indiana .....Tel. 2-5650
Norwalk, Ohio .....Tel. 3-0231
Lansing, Michigan .....Tel. IV-5-7642
Pekin, Illinois .....Tel. 6-6336
Erie, Pennsylvania .....Tel. 2-4300
Sumter, South Carolina
PERFORMANCE Has Built Our Business

XUM

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less.
Classified advertisements must reach us 8 days before publication date.

HELP WANTED

CABLE SPLICERS, Station Installers, Equipment Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 1211 Kenmore Avenue, Elkhart, Indiana, or 6100 N. 20th St., Philadelphia, Pa.

WANTED: Telephone Installers, Cable Splicers, Linemen, Central Office Installers. Yates Construction Company, 1507 South 6th St., Paducah, Kentucky. Telephone 2-4623.

WANTED

Assistant to President and General Manager of Independent system with 10 exchanges. Converting entire system to dial about January 1, 1958, with about 5,700 stations. Person selected must be an experienced, Independent telephone man capable of directing Traffic, Plant, Commercial and Accounting activities. Starting salary $8,000-$10,000 range. If you are interested, apply before June 15, 1957, by letter only, giving complete details on age, education, experience, positions held and salary. Applicants selected for personal interview will be notified by July 1, 1957.

Write
Eastern Illinois Telephone Company, Rantoul, Illinois

HELP WANTED

MICROWAVE
CARRIER MAINTENANCE

Interesting position available to man with initiative. Experience with radio, carrier and automatic telephone switching essential. Second class radio license desired. Telephone Company located in a fast growing Florida city. Write Box No. 1080, Tallahassee, Fla.

PLANT ENGINEERS for large Independent Telephone Company. Some experience necessary. In reply state age, educational and employment history. Address reply to Personnel Supervisor, Rochester Telephone Corporation, 10 Franklin Street, Rochester 4, N. Y.

POSITION WANTED

TRAFFIC ENGINEER, college graduate, six years experience, desires relocation and traffic supervisor position. Experienced in all phases of the traffic department; including toll separation studies. Write Box No. 3982, c/o TELEPHONY.

WANTED TO BUY

TELEPHONES—all types—any condition; candlesticks, wall sets, etc. Write advising quantities available. Our truck will pick up. Reply to Box No. 3952, c/o TELEPHONY.

WANTED TO BUY

MAGNETO TELEPHONES AND PARTS. Highest market prices. Write Telephone Company, Turtle Lake, Wisconsin.

DESIRE TELEPHONE COMPANY of 300 or more stations. Will convert to dial. Send details to Box No. 3981, c/o TELEPHONY.

Private party will pay cash for all or part stock interest in telephone operating property 5,000 to 30,000 stations. Cash also available for conversions. Write Box No. 3953, c/o TELEPHONY.

WANTED TO BUY
TELEPHONE OPERATING COMPANY
Write: Box No. 3856, c/o TELEPHONY

FOR SALE

CABLE GRIPS, pulling, split, single weave, double eye—$2.25 each, prepaid. H. L. BOGGESS & SONS, Liberty, Mo.

150 KELLOGG 900's dial desk sets and miscellaneous parts. Write Guy Morrow, 184 N. E. 38th Ave., Portland 13, Oregon.

AS REMOVED FROM SERVICE. Kellogg #1000 Series Desk Sets, 1000 ohm Straight Line Ringers, Neoprene Cords. Clean—$10.00 per set. Write Box No. 3977, c/o TELEPHONY.

NORTH ELECTRIC ALL RELAY MCXR-1000—wired for 200 lines, equipped for 180 lines. Good condition. Less Charger. Less Batteries. Write Sully-Buttes Telephone Cooperative, Inc., Highmore, S. D.

RECLAIMED DROP WIRE — Copperweld, Neoprene parallel, short lengths, 90 or more feet per run. $11.00 per M feet FOB Chicago, Ill. Write Independent Telephone Repair Co., 2137 W. 21st St., Chicago 8, Ill.

ONE 100 LIKE KELLOGG RELAYMATIC 24V PBX with accessories. Excellent condition—ideal intercommunication for factory, clinic or hospital. Will crate and deliver within 800 miles for $2,200. Arlington Telephone Co., Arlington, Ala. DUpont 5-2285.

RECONDITIONED

SWITCHBOARD LINE ADDITIONS

KELLOGG

JACKS	LAMPS	RELAYS
258	25	2029-SAH and 2048-SR
261	34	2029-SAH and 2048-SFG
267	41	2093-CEA and 2058-CDG
269		26-D
273		261-A
369		

STROMBERG-CARLSON

JACKS	LAMPS	RELAYS
130 on 80	121 on 80	194-A and 193-BB
134 on 80	121 on 81	on 105-L mtgs.
135 on 80	121 on 61	
109 on 63		

WESTERN ELECTRIC

JACKS	LAMPS	RELAYS
141 on 112	12 on 137	AB-1 and AB-2
295 on 112	12 on 102	
49 on 114		

BUCKEYE TELEPHONE & SUPPLY CO.

Dept. T, 1250 Kinnear Rd. HU 8-0655 Columbus 21, Ohio

XUM

FOR SALE

AUTOMATIC ELECTRIC DIAL EXCHANGE—650 lines. Plunger line switch—20% trunking on selectors. 2 sets Kellogg vibrator ringing machines, synchromonic. 2 sets Holtzer-Cabot ringing interrupters. 200 A. H. battery. All in good condition. Price—$6,000. Have to vacate building. If interested, call or write Randolph Telephone Co., Liberty, N. C.

1 2-POSITION MONARCH SWITCHBOARD, good condition.
100 Kellogg Kicks Coils $2.00 each.
25 Leich No. 901 1000 Ohm phones $18.00 each.
30 Leich No. 911 1600 Ohm phones $20.00 each.
2 W. E. operators set late type $6.00 each.
200 Cook Protectors, 10 in bank, $3.00 a bank.
1 Raytheon Rectifilter 24 volt output.
1 Raytheon Rectifilter No. 1057-R.
All FOB Hospers, Iowa.
Hospers Telephone Exchange, Hospers, Ia.

3-POSITION W. E. No. 11 CB SWITCHBOARD.
400 line multiple L & Co. Relays.
1-Position W. E. No. 104 Magneto Board.
150 lines, 5 toll—5 dial trunks.
Kick Coils. 93A Rep. Coils.
W. E. 302 telephone with dials.
W. E. Composite Sets per SD 95032-01.
North Electric CX trunks Automatic to Manual.
North Electric CX trunks Auto. to Auto.
W. E. Main Frame Protectors.
Nicopress Sleeves No. 114D for 9 gauge copper.
Valley Head Telephone Co., Valley Head, Ala.

• CODE-TO-SELECTIVE RINGING CONVERTERS
• DIGIT ABSORBERS
• COMPUTER INTERCEPTS
UNIVERSAL CONTROLS CORPORATION
P.O. BOX 13122 • DALLAS 20, TEXAS

G.M.P. Co. CABLE LASHERS
GOOD USED TYPE "B" SPINNER WITH CHEST
PRICE $95.00 F.O.B. CHICAGO
LINE EQUIPMENT SALES
529 S. DEARBORN ST., CHICAGO 5, ILL.

RECONDITIONED LEICH #901 MAGNETO COMPACT WALL OR DESK SETS. 1600 ohm with strong generator for long rural lines. Units like new and only several years old. Can be converted to C.B. or dial operation.

PRICE $22.50 EACH
12 to 24—$22.00 EA.
24 to 50—$21.50 EA.
BOHNSACK EQUIPMENT CO.
GERMANTOWN, NEW YORK

SPECIAL OFFER
Aerial, Duct and Exchange Area Cable—REA Approved
Ankoseal 775-P and Equal
LOW PRICES—QUANTITY DISCOUNTS!!

Size	Lengths Range
51 Pair, 24 Gauge	100' To 1200'
101 Pair, 24 Gauge	80' To 1500'
152 Pair, 24 Gauge	70' To 600'
202 Pair, 24 Gauge	100' To 1000'
303 Pair, 24 Gauge	300' To 1000'
* * * * *	
11 Pair, 22 Gauge	70' To 2300'
16 Pair, 22 Gauge	100' To 1500'
26 Pair, 22 Gauge	100' To 2000'
51 Pair, 22 Gauge	70' To 2400'
76 Pair, 22 Gauge	100' To 1700'
101 Pair, 22 Gauge	70' To 600'
202 Pair, 22 Gauge	80' To 280'
* * * * *	
11 Pair, 19 Gauge	70' To 360'
16 Pair, 19 Gauge	150' To 1900'
26 Pair, 19 Gauge	1500' To 2400'
51 Pair, 19 Gauge	100' To 900'
101 Pair, 19 Gauge	100' To 2900'
202 Pair, 19 Gauge	60' To 780'
* * * * *	
Self-Supporting Jacketed Cable—PSS:—	
6 Pair, 19 Gauge	100' To 3000'

ALSO COMPLETE STOCK—FULL REELS—6 Pr. to 303 Pr.
Terms: 1% 10 days, Net 30; FOB DESTINATION
TELE-WIRE SUPPLY CO., INC.
146 Front Street Call HAnover 2-9690 N. Y. 5, N. Y.

What You Want
When You Want It
Immediate Shipment from Nearest Warehouse Points
TELEPHONE & POWER SUPPLY, INC.
TOPEKA, KANSAS PHONE 4-8788

TELEPHONE PRINTING
By People Who Know the Telephone Business
SEE THE SUTTLE CATALOG
SUTTLE EQUIPMENT CO.
LAWRENCEVILLE ILLINOIS

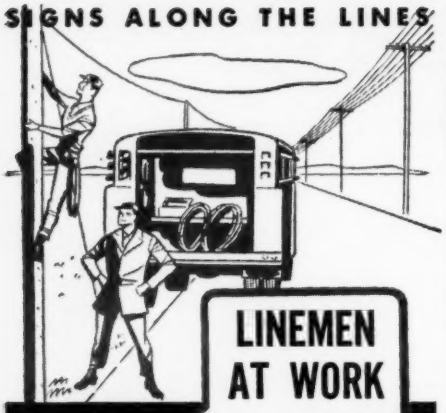
FOR ALL OF YOUR CENTRAL OFFICE AND PBX INSTALLATIONS, MODIFICATIONS, AND ENLARGEMENTS, IT'S THE
T. E. I.
TELEPHONE ELECTRONICS INSTALLATION CORP.
Hayes Bldg., 12 E. Tenth St., Erie, Pa.
CAN WE BE OF SERVICE TO YOU?

ROBERT E. FOLEY CONSTRUCTION CORP.
DESIGN—SURVEYS—APPRAISALS—Construction and Maintenance of Overhead and Underground Telephone Plant. Complete supply of poles available for emergency requirements.
48 GRISWOLD STREET
BINGHAMTON, N. Y. TEL. 2-7218

TUDOR AND YAGER, INC.
Telephone Construction
TIPTON, INDIANA
PHONE 125

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

SIGNS ALONG THE LINES



LINEMEN AT WORK

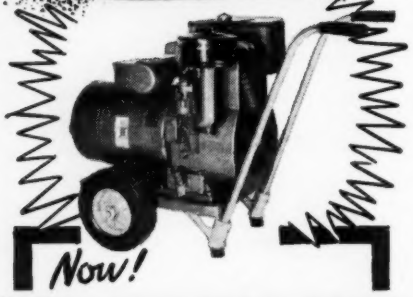
USING *Crapo* GALVANIZED GUY & MESSENGER STRAND

Positive strength and durability economies, combined with the superior qualities of steel, make *Crapo* Galvanized Steel Strand a rugged performer. The heavy, ductile, tightly-adherent galvanized coating — applied by the famous *Crapo* Process — provides dependable protection for the steel, prolongs the expectant life of the strand. There is a size and grade of *Crapo* Galvanized Strand for every practical need.

INDIANA
STEEL & WIRE COMPANY, INC.
Muncie, Indiana

Katolight

PORTABLE POWER PLANTS



Now!

CREWS HAVE READY POWER FOR ANY JOB... ANYWHERE!

You save time . . . You speed work . . . because with Katolight Portable Power Plants, crews have "plug-in" electricity instantly available to operate all types of tools, equipment, lights, right on the job, regardless of location or conditions. Sizes and models for every portable, standby or continuous use. Dolly or Skid mounted models from 350 watts to 75 K.W. A.C. Up to 500 KVA on request.

DEPENDABLE ELECTRICAL EQUIPMENT SINCE 1928!

WRITE TODAY FOR NEW FREE FOLDER!

KATOLIGHT CORPORATION
Box 891-12 . . . . . Mankato, Minnesota

Index to ADVERTISERS

	Page
Acme Visible Records, Inc.	—
Alphaduct Wire & Cable Co., The	57
Aluminum Company of America	30-31
American Appraisal Company, The	—
American Chain & Cable Co., The Page Steel & Wire Div.	—
Wright Hoist Div.	59
American Creosoting Corporation	63
American Electrical Heater Co.	—
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	46-47
Anaconda Wire & Cable Co.	—
Ansonia Wire & Cable Co., The	33
Armstrong Cork Co., Glass Insulators	—
Atlantic Creosoting Co., The	—
Automatic Electric Sales Co.	12, 34-35, 40-41, 67
Bakelite Company	—
Baker Wood Preserving Co.	—
Bartlett Tree Experts	13
Bashlin Company, W. M.	—
Bell Telephone Laboratories, Inc.	—
Benner-Nawman, Inc.	60
Berry & Co., L. M.	—
Bethlehem Steel Co.	—
Biddle Co., James G.	—
Bishop Manufacturing Corp.	—
Blaw-Knox Company	—
Bohnsack Equipment Co.	65
British Insulated Callenders' Cables, Ltd.	—
Buckeye Telephone & Supply Co.	64
Burgess Manning Company	—
Burroughs Corp.	—
C&D Batteries, Inc.	—
Cabaniss-Pogue Co.	62
Cable Breather Corp.	—
Cable Spinning Equipment Co.	—
Calculagraph Company	—
Chance Co., A. B.	—
Chase Brass & Copper Co.	59
Cleveland Inst. of Radio Electronics	—
Cleverly Electrical Works, The	—
Coffing Hoist Div.	—
Colorado Fuel & Iron Co., The	—
Commercial Cord and Supply Co.	—
Comptometer Corporation	—
Copperweld Steel Co.	—
Crane, Inc., Carl C.	62
Cullom & Ghertner	—
Davis Construction Co.	—
Donnelley & Sons, R. R.	59
Dow Chemical Co., The	10-11
Du Pont de Nemours & Co., E. I.	—
Duo-Safety Ladder Corp.	—
Eastman Chemical Products, Inc.	—
Electric Specialty Co.	—
Everstick Anchor Co.	—
Exide Industrial Division— The Electric Storage Battery Co.	37
Fitchburg Engineering Corp.	—
Foley Constr. Co., Robert E.	65
General Cable Corporation	—
General Insulated Wire Works, Inc.	—
General Machine Products Co., Inc.	—
General Telephone Directory Co.	68
Gorman Rupp Company	—
Gould-National Batteries, Inc.	—
Graybar Electric Co.	—
Greenlee Tool Co.	54
Haley & Co., R. G.	56
Harris-McBurney Company	63
Henkels & McCoy	63
Highway Trailer Company	—
Hirsch Organization, Inc., Gustav	—
Holan Corp., J. H.	—
Homelite Corp.	49
Hubbard & Company	—
Indiana Steel & Wire Co.	66
Industrol Corporation	—
International Business Machines Corp.	—
International Harvester Co.	—
Irwin Auger Bit Co.	—
Johns-Manville	—
Justrite Mfg. Co.	62
Katolight Corp.	66
Kearney Co., Jas. P.	—
Kellogg Switchboard & Supply Co.	6-7
Kennecott Wire & Cable Co.	59
Killoren Company	63
Klein & Sons, Mathias	58
Koiled Kords, Inc.	—
Koppers Co., Inc.	—
Leich Sales Corporation	26-27
Lindsay Telephone Supply Co.	—
Line Equipment Sales	63, 65
Lorain Products Corp., The	—
Magnolia Chemical Company, Inc.	—
Malleable Iron Fittings Co.	—
McCabe-Powers Auto Body Co.	—
McFarland Company, L. D.	63
McGrath Engineering, Inc.	62
Morrison-Pelsue Co.	—
Mullen Construction Co.	63
Murphy Engineering Laboratories	60
Natco Corporation	—
National Pole & Treating Div.	—
National Standard Company	—
National Telephone Supply Co.	—
Neale Construction Co.	65
Neubauer Manufacturing Co.	—
Neuses, Inc., P. K.	—
North Electric Company	14-15
Onan & Sons, D. W.	—
Orangeburg Manufacturing Co., Inc.	—
Osmose Wood Preserving Co.	—
Owens-Illinois	25
Page & Hill, Inc.	—
Phelps Dodge Copper Products Corp.	—
Philco Corp., Gov't & Industrial Div.	—
Plastic Wire & Cable Corp.	—
Porter, Inc., H. K.	—
Preformed Line Products Co.	16
Prewitt & Sons, Inc., J. B.	—
Radio Engineering Products Limited	—
Raytheon Mfg. Co.	—
Recordak Corp.	43
Reliable Electric Co.	5
Remington Rand Div.	45
Rex Corporation, The	—
Reynolds Metals Company	—
Roebling's Sons Corp., John A.	—
Rolatape, Inc.	—
Runzel Cord & Wire Co.	56
S&G Manufacturing Corp.	52
Schauer Mfg. Co.	—
Sequoia Process Corp.	—
Seymour Smith & Sons, Inc.	—
Sierra Electronic Corp.	—
Sloan, Cook & Lowe Co.	62
Soapstone Duct Co.	—
Stainless, Inc.	54
Stanley-Yankee Tools, Inc. a subsidiary of The Stanley Works	—
Stewart Bros.	62
Stewart-Warner Corp., Electronics Div.	—
Stromberg-Carlson Co.	2-3, 8-9, 50-51, 62
Superior Cable Corporation	53
Suttle Equipment Co.	65
Taylor-Colquitt Co., The	—
Telectric Co., The	63
T.E.I. Corp.	65
Tel-E-Lect Products, Inc.	—
Telephone & Power Supply Co.	65
Teletype Corp.	—
Tele-Wire Supply Co., Inc.	65
Telkor, Inc.	—
Templeton, Kenly & Co.	—
Tudor & Yager, Inc.	65
Underwood Corporation	—
U. S. Cable Constructors, Inc.	—
United States Independent Telephone Association	—
United States Instrument Corp.	—
United States Steel Corp. American Steel & Wire Co.	—
Universal Controls Corp.	65
Utica Drop Forge & Tool Div.	—
Utility Body Co.	55
Utility Equipment Co.	—
Utility Tool & Body Co.	—
Warn Mfg. Co.	—
Weikel Line Company	63
Western Electric Co.	—
Wheelock Signals, Inc.	—
Whitney Blake Co.	—
Williams Inspection Co., Inc., A. W.	62
Willys Motors, Inc.	—
Wiremold Co., The	60
Yates Construction Co.	63
York-Hoover Corporation	—

Here are CARRIER* systems

engineered by telephone men

for telephone men

The engineers you'll meet at Automatic Electric and Lenkurt *know* the telephone industry because they are telephone men themselves. With first-hand knowledge of telephone operations, these men are in a position to help solve the transmission needs of telephone companies —regardless of size. They *specialize* in the engineering, manufacture, and installation of systems adapted specifically to meet telephone toll plant requirements.

And, because they have available a complete line of systems, they'll be able to recommend the *best* system for *you* . . . whether it's carrier telephone equipment for open wire, cable, or radio . . . or radio equipment itself. Why not give them a call? You'll find they talk your language.

Address: Automatic Electric Sales Corporation, 1033 West Van Buren St., Chicago 7, Illinois (HAymarket 1-4300). *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto. *Offices in principal cities.*

* They're **LENKURT'S** MULTI-CHANNEL COMMUNICATION SYSTEMS, of course.

AUTOMATIC ELECTRIC

A member of the General Telephone System – One of America's great communications systems

GENERAL TELEPHONE SYSTEM

XUM

is a big spread a good spread?

Not for him! But definitely yes when you're talking about rising costs and profit margins. So if your directory is off the straight and narrow, blaze a trail to our Complete Directory Service Plan.

We completely handle the directories of independent telephone companies in 4400 communities today . . . and show them larger revenues than they thought possible.

Like to know how it's done? We'll be happy to show you. Just call or write our nearest office.

GENERAL SYSTEM

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Busse Highway • DES PLAINES, ILLINOIS • VAnderbilt 4-2164

Divisional Sales Offices

COLUMBIA, Mo. • 811 Cherry Street • GIbson 2-6907
DURHAM, N.C. • 108 E. Parrish Street • Tel: 5133
ERIE, Penna. • G. Daniel Baldwin Building • Tel: 2-4187
FORT WAYNE 2, Ind. • 229 E. Berry Street • Eastbrook 3477
LEXINGTON, Kentucky • 157 Walnut Street • Tel: 4-7626
LONG BEACH 15, Calif. • 1775 Ximeno Ave. • HEmlock 3-7441
MADISON, Wisconsin • Tenney Building • ALpine 7-1667
SAN ANGELO, Texas • 110 South Taylor St. • Tel: 6738
SPOKANE, Wash. • 108 N. Washington St. • MAdison 4-4336
SPRINGFIELD, Ill. • Myers Bros. Building • Tel: 8-3425

JUN 15 1957

XUM